The New Lineup . . . Charts on Pages 10-13

IBM 4300 Churns Up CPU Scene

By Marcy Rosenberg
And John Whitmarsh
CW Staff

The announcement of IBM's 4300 series last January started the mainframe market churning, spawning a fleet of new mainframes and IBM software-compatible systems.

The 4331 and 4341 — sailing in, if only on paper, with at least a 3:1 price/performance improvement over the IBM systems they replaced — set a new pace in the mainframe regatta, forcing three software-compatible mainframe contenders — National Semiconductor Corp., Itel Corp. and Multiprocessors, Inc. (formerly Citel Corp.) — to withdraw announced systems.

At the same time, several mainframers — most notably Honeywell, Inc. — and software-compatible competitors such as Nanodata Corp. and Cambridge Memories, Inc., reacted to the 4300 introductions by relabeling systems already on the market.

In the charts beginning on Page 10, *Computerworld* attempts to place post-4300 product entries in perspective, listing them along with high-end mainframe and software-compatible systems and the IBM systems with which they compete.

NCR and Burroughs First

It wasn't until March that vendors publicly reacted to the 4300 with new product announcements. At the beginning of the month, NCR Corp. and Burroughs Corp. brought out systems competitive with the 4331 and 4341 [CW, March 5].

NCR introduced five bus architecture-based systems, four of which comprised the new V-8500 mainframe line, designed to run in either uniprocessor or multiprocessor configurations. These were the V-8555M and V-8565M — said to bracket the IBM 4331 performance range — and the V-8575M and V-8585M, bracketing the 4341 in performance. A fifth processor, the V-8455, offered an upgrade to the current V-8400 family.

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NEWSPAPER

IBM Trading Information On Software

By Don Leavitt
CW Staff

Available formally for the first time in April, a Software Information Exchange (SIE) between IBM and a growing number of independent software firms is too new to have produced any benefits for the user community yet.

But they will come, according to Lee Keet, president of Turnkey Systems, Inc. and a member of the Association of Data Processing Service Organizations' (Adapso) ad hoc committee that negotiated the SIE agreement with IBM.

Under the terms of the exchange program, IBM has agreed to provide each of the participating independent vendors with copies of all publicly available documentation about a new or modified Program Product as soon as it has reached the point of first release. The independents have agreed to reciprocate.

Out of this mutual exchange, users will get "much closer coordination between new releases of products between IBM and the independents," Keet said. "For example, if IBM introduces a new data base management system or an operating system, independents who interface with that product and who are in SIE will be able to assure their customers about compatibility much earlier in the cycle than before.

"A good example is 'The VSE Question' — Will your product run under DOS/VSE? Many vendors have been unable to answer that question because they don't have enough information about IBM's new software. But inde-

(Continued on Page 8)

Lying in Wait for H Series

Itel Unwraps High-End Processors

By John Whitmarsh
CW Staff

SAN FRANCISCO — Itel Corp. last week unveiled two high-end processors, one positioned against the IBM 3033 and the other poised for the long-awaited IBM H series.

Developed jointly by Itel and Hitachi Ltd. of Japan, the two CPUs — the AS/7 Model 7033 Dual-Processor Complex and the AS/8 Model 7034 — are the most powerful units in the company's Advanced Systems family of mainframes. Both are virtual storage, air-cooled machines compatible with the IBM 370 and 30 series.

Of special interest, the higher performance of the AS/8 is achieved through new 550-gate large-scale integration (LSI) logic components. The high-density, high-speed chips represent "fifth-generation semiconductor technology," Itel claimed.

In price and performance, both models are aimed squarely at IBM mainframes.

The dual-processor AS/7-7033 boasts performance "equal to or better than the IBM 3033" when operating under identical programs and in a similar configuration, Itel said. It packs nearly twice the wallop of the AS/6 Model 7032, the company's previous top model.

With 4M bytes of main memory and a 12-channel configuration, the AS/7-7033 costs $3,240,000. Additional increments of main memory cost $75,000 per 1M byte. First customer shipments are scheduled for October.

More powerful still is the AS/8-7034, which has 1.6 times the performance of the AS/7-7033 and 2.6 times the power of the AS/6-7032, according to Itel figures.

Configured with 4M bytes of main memory and 12 channels, the AS/8-7034 is scheduled for July 1980 shipment.

Its price was not announced, but a spokeswoman said it will be competitive with the anticipated IBM H series: "We won't price ours until they price theirs."

High-Performance Chips

The chief feature of the AS/8 is the incorporation of 550-gate LSI semiconductor technology. Itel credited a portion of the AS/8's high performance to these chips, saying improvements in chip manufacturing and new advances in photolithography were required to achieve their high density and .7 nsec switching times.

Performance characteristics of the AS/8 include:

- Processor cycle time of 42 nsec.
- Two-way interleaved 64K-byte cache buffer storage with 21 nsec cycle time.
- 100 nsec main memory access time.
- Eight-way interleaved main memory and 32-byte data path transfer operation.
- High-Speed Arithmetic (HSA) fea-

(Continued on Page 6)

Bowne Exec Faces Charges For Accessing Rival's Net

By Brad Schultz
CW Staff

NEW YORK — Federal Bureau of Investigation agents arrested an officer of New York-based Bowne Information Systems, Inc. here last week for allegedly tampering with a rival service bureau's computer-stored data.

David T. Herr, Bowne Information's vice-president of business development, surrendered to the FBI last Wednesday following his indictment by a Los Angeles grand jury on 10 counts of wire fraud. Herr allegedly retrieved and manipulated the "internal administrative" data of Proprietary Computer Systems, Inc. (PCS) on 196 different occasions between Nov. 19 and June 11, consuming about 48 hours of CPU time.

Through a communications relay facility in Chicago, Herr employed operator identification codes, passwords and "internal command signals" over telephone lines to learn the nature of PCS' business dealings, an FBI spokesman said. According to the indictment issued July 5, Herr deleted 158 access codes from the main PCS computer system near Los Angeles, causing it to deny access to the subscribers assigned those codes.

Vying for Contracts

The FBI did not identify the PCS customers affected by the alleged breaches, but noted that the firm's clientele includes four major federal agencies: the State Department, Department of the Treasury, General Services Administration and Tennessee Valley Authority.

Moreover, the breaches occurred

(Continued on Page 4)

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Firm's Board Reviewing Case

IBM Changing Tack in Trial?

By Connie Winkler
CW Staff

NEW YORK — IBM may be contemplating a major change in strategy in the U.S. vs. IBM antitrust case.

Attorneys on IBM's board of directors early this week began reviewing the status of the case, and the trial in U.S. district court has been adjourned to July 19 to await their decision.

Observers of the case call IBM's move both unusual and puzzling. IBM will not specify what the directors are considering, but Judge David N. Edelstein suggested several of the more likely options at a chambers conference July 9 when he allowed the 10-day adjournment.

Edelstein said he was just speculating, but that IBM may decide to:

- Rest its defense, which started in April 1978.
- Revive its off-again, on-again settlement discussions with the Antitrust Division of the Justice Department. (Both sides, however, said there have been no contacts with the Justice Department regarding settlement.)
- Refuse to comply with Edelstein's June 25 order to turn over extensive documents in connection with the testimony of IBM Chairman Frank T. Cary.

Edelstein said he was prompted to speculate about the special committee because "it's a very unique situation."

'Urgent and Essential' Break

"It seems to me that in a trial of this magnitude and with what is at stake . . . an additional 10 days is not an unreasonable request," argued IBM's lead counsel, Thomas D. Barr. Barr assured Edelstein that the adjournment was urgent and essential and would be in the best interests of the court, counsel and justice.

The trial has been adjourned since April 10 to allow Edelstein to consider 17 motions, including the one on the Cary documents and one still pending on relief issues in the event IBM is found to be a monopoly.

"I am not free to reveal what the committee is reviewing," Barr said. "The committee is a committee of experienced lawyers. They are performing the function of the client in this case in order to make up its mind what it ought to do."

Directors on the special IBM task force are Irving S. Shapiro; Carla Anderson Hills, Washington, D.C. attorney and former Secretary of Housing and Urban Development; William T. Coleman Jr., former Secretary of Transportation; William W. Scranton, former Governor of Pennsylvania; and John N. Irwin, New York City attorney and former assistant secretary in the Defense Department.

Also on the review committee are Barr and IBM's general counsel, senior vice-president and former U.S. Attorney General Nicholas deB. Katzenbach.

'Catastrophic' Ruling

The committee first met the day after Edelstein ruled on the Cary documents, Barr said. IBM estimated it would take 62,000 man-years and cost $1 billion to scour 120 locations for those five billion sheets of paper. The day the ruling was made Barr called it "catastrophic" and said it would be months, perhaps years, before the trial could resume.

Hills last week told the *Wall Street Journal* the IBM directors were concerned about the length of the IBM case in view of the relatively quick pro-IBM decisions handed down in suits brought against IBM by private companies. The government antitrust case — which is in its 10th year and fifth trial year — is a "terrible drain" on the company, Hills said.

At the scheduling conference last week, the head of the government trial team, Robert J. Staal, urged that the trial be moved ahead and the next four witnesses allowed to testify. "I do not [understand] . . . why IBM and [the law firm representing it], with all their resources, can't go forward with the trial while at the same time considering whatever it is they are considering."

The government objected to the adjournment, and Edelstein agreed he had "absolutely no basis for granting the adjournment."

Since Edelstein's June 25 order, the Antitrust Division has suggested to IBM specific ways of narrowing the Cary document request. In addition, both sides are considering limiting the direct testimony of Cary to his previous testimony in the Memorex vs. IBM and Transamerica vs. IBM cases.

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A Certified Psychotic

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — Perry is convinced the Mafia is out to get him. He also fears "foreigners are trying to run the country" and criticizes "immigrant types" for acting "kind of funny."

He even suspects "crooks" and "tricky operators" of having gypped him at the horse race tracks he reportedly frequents.

Perry is a certified psychotic — a paranoid, to be exact. He also happens to be a computer.

Housed in Stanford University's Artificial Intelligence Laboratory, Perry has been programmed by psychiatrist Dr. Kenneth M. Colby to realistically simulate paranoid thinking and behavior in humans.

Colby, a professor of psychiatry and computer science at the University of California at Los Angeles (UCLA), undertook the programming project in an effort to trace paranoia's causes and possibly find a cure for the rare but disabling psychosis.

Unlike many of his fellow psychiatrists, Colby regards paranoia less as a mental illness than as a strategy for coping with humiliation. In today's society, two of the most common sources of paranoia-producing humiliation are romantic disappointment and job failure, the UCLA psychiatrist said.

To test his theory, Colby and several of his graduate students spent years developing a paranoia model with the help of Stanford's Digital Equipment Corp. Decsystem-10 time-sharing system; which runs under DEC's 10X operating system. Colby based his program, which was written in machine language and three versions of Lisp, on his years of experience in interviewing hundreds of paranoid patients.

"My theory of paranoia implies certain consequences, and we tried to write those consequences out as instructions, as rules in the program," he explained.

The effort proved a "tremendous programming task," Colby said, but in the end it produced a computer-based paranoid model whose responses were so realistic they were virtually indistinguishable from those of a paranoid human. Colby and his associates nicknamed the model and its supporting processor "Perry" (short for "paranoid").

Tested by Psychiatrists

Not surprisingly, Perry's activities share little in common with more conventionally programmed processors. For most other mainframes, DP work seldom involves anything more exotic or sinister than payroll preparation or general ledger accounting.

But for Perry, the paranoid processor, "life" consists of an endless procession of dark suspicions and persecutory delusions.

The extent of Perry's imaginary "fears" was perhaps best illustrated during a recent test of Colby's computer-based model, In the experiment, six psychiatrists conducted a total of 12 long-distance psychiatric interviews through an on-line terminal at the University of California at Irvine campus. Six of the interviews involved bona fide human paranoids, who answered ten psychiatrists' questions through a second on-line terminal at UCLA. In the other six interviews, the examiners questioned Perry.

At no time were the psychiatrists told whether they were communicating with a human paranoid or with a computer-based model. After conducting two interviews each, the analysts were asked to identify the unseen "patients" as either human or simulated.

In slightly more than half the cases, the psychiatrists guessed incorrectly. For Colby, the test results were heartening but still far from conclusive.

Interpreted one way, the results suggest that Colby's computer-based model convincingly duplicated the thinking and responses of a true paranoid patient. If correct, this interpretation would support, though not prove, Colby's theory of humiliation as a cause of paranoid behavior.

Interpreted another way, however, the test results could mean simply that the six participating psychiatrists were unskilled at identifying the interviewees or that they lacked enough information to guess accurately.

Much more research will have to take place before the "humiliation theory" of paranoia is definitively proven or refuted, Colby said.

Dartmouth to Offer Master's in DP Field

HANOVER, N.H. — Dartmouth College will institute a master's degree program in computer and information science in the fall of 1980, joining a handful of liberal arts colleges that offer such a degree.

Made possible by a $500,000 grant from IBM that will help support it for five years, the program is the first graduate professional program authorized by the school's board of trustees since the founding of the Amos Tuck School of Business Administration in 1900.

The program will produce persons who can "fill a void between management in businesses that use computing and those versed in computer technology," according to Stephen J. Garland, associate professor of mathematics, who will chair the program.

In 1980, Dartmouth will enroll 20 students in a two-year program leading to the degree of master of science in computer and information science. The number of enrollees will double with the admission of a second class in 1981.

A need exists in the business world for about 10 times more people with the expertise the Dartmouth program will provide, according to Kent Morton of Dartmouth's Kiewit Computation Center, who assisted in the program's development.

"Business and industry have long felt that traditional academic programs in computer science were ill-suited to their needs," Garland noted. "Those programs turned out people skilled at research and at teaching, but with little or no knowledge of the applications to which computing is being put today.

"Dartmouth has a reputation for designing computer systems with the needs of the users in mind," he added. "We will emphasize the human aspects, the needs of people working with computer systems and how those systems impact the social systems in which they operate."

Besides being the place of birth of the computer language Basic, Dartmouth developed a time-sharing system that facilitates the simultaneous use of the computer for educational purposes and research. In addition, Dartmouth has just instituted an undergraduate computer science major.

FBI Arrests Bowne Official

(Continued from Page 1)

while PCS and Bowne Information prepared to compete with each other for contracts with the U.S. Air Force, Department of Transportation and Environmental Protection Agency, the FBI source stated. The FBI is investigating whether Herr was trying to undermine PCS' chances at winning those lucrative deals, he said.

Ongoing Investigation

At this point, more is known about what Herr allegedly did than why he did it, according to assistant U.S. Attorney Thomas J. Nolan, who will probably prosecute Herr in Los Angeles. Federal investigators are still trying to learn what, if any, sensitive files were tapped and whether national security was jeopardized.

If convicted, Herr faces maximum penalties of five years' imprisonment and a $1,000 fine for each of the 10 wire fraud counts named in the grand jury indictment. Use of a telephone to obtain unauthorized access to a computer system constitutes wire fraud, a felony, according to current interpretations of the U.S. criminal code, Nolan explained.

Nolan requested the grand jury probe, which lasted over a period of six weeks, after the FBI brought the matter to his attention. Nolan and John Sifert, his counterpart at the New York U.S. Attorney's office, assisted a separate investigation by the FBI New York office's Financial Crimes Section that led to Herr's arrest.

Herr is scheduled to enter his answer to the charges in a Los Angeles federal court on July 23. Nolan will lead the prosecution if Herr pleads not guilty.

However, Herr could arrange a New York prosecution led by Sifert by pleading guilty, the FBI source stated. At press time, Bowne Information, a subsidiary of Bowne & Co., declined comment on the case.

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Commission to Oversee Activity?

CCIA, Cbema Clash Over FTC Standards Role

By Jake Kirchner
CW Staff

WASHINGTON, D.C. — A Federal Trade Commission (FTC) proposal to take over regulation of standards and certification of DP products for federal computer procurements has elicited strongly conflicting responses from industry trade groups.

At a recent FTC hearing here on the proposal, which is backed by the Computer & Communications Industry Association (CCIA), a second group, the Computer and Business Equipment Manufacturers Association (CBEMA), said FTC action in this area would constitute "excessive and unneeded regulation."

While the CCIA supports FTC oversight of standards-making activity, Cbema claimed it would destroy the present voluntary standards system, a system Cbema says is demonstrably adequate.

The proposed trade regulation rule on standards and certification is the result of a recent FTC staff study that covered commodities ranging from computers to pup tents and bathtubs. Hearings on the staff report will continue through the summer, with final rulemaking targeted for next May.

After investigating complaints that IBM controls the mainframe and peripherals standards-making process, the FTC staff concluded that "in the computer industry, interface standards of the dominant 'mainframe' manufacturer dictate the design of 'plug-compatible' components offered by other producers."

The report also noted that "producers of peripheral equipment for computer systems . . . have charged that the large computer manufacturers control the American National Standands Institute X-3 Committee, which has jurisdiction over interface standards for computers and the peripheral equipment."

Cbema 'Deeply Disturbed'

At the recent hearing, Cbema, which acts as secretariat for X-3, said it is "deeply disturbed" by the allegations that large manufacturers dominate the standards development process.

The Cbema testimony, delivered by association President Vico E. Henriques, called the charges "misleading" and claimed they were derived from "statements which are sweeping generalizations, contradictory and false."

Henriques said "the voluntary consensus standards system is doing an excellent job at little or no cost to the government . . . The allegations cited in the commission staff report — whose correctness we do not concede — are compiled from only about 20 cases during a 10-year period. Compare this with the thousands of standards developed by this [voluntary] system during the same period which have been implemented beneficially, without complaint."

He charged that "if promulgated, the proposed Federal Trade Commission rule would impact the standards development process negatively by increasing costs, delaying or possibly stopping development of some standards, discouraging volunteers from participating in standards activities and discouraging the smaller, more specialized standards developers from continuing their activities."

CCIA Disagreement

The Cbema conclusions were strongly disputed by the testimony of CCIA President A.G.W. Biddle, who told the commission that "in the computer industry, one reaches the inescapable conclusion that dominant firm oligopoly power has subverted the self-regulatory capacities of the economy via the voluntary standard-making process."

The CCIA is "thoroughly convinced that the present state of standards making in the computer industry is one of the principal supports for the maintenance of an anticompetitive industry structure."

Because the large computer manufacturers "have a strong economic incentive to maintain their market shares, they have consistently followed a policy of inhibiting the development of industry wide standards which would promote greater competition in the industry," Biddle contended.

"The loser in this process is the consumer," he added."The waste and confusion of standards development in the computer industry has cost, and continues to cost, the federal government over $1 billion annually and the private sector over $5 billion annually."

The CCIA executive called the proposed FTC rule a step in the right direction and further recommended the establishment of a "Computer and Communications Standards Board" (CCSB) to be financed jointly by the government and private industry.

Modeled after the Financial Accounting Standards Board, the DP standards board "would be under the full time direction and control of a board of directors drawn from both the government and the private sectors, including representatives from large and small providers and users," according to the CCIA plan.

"Of utmost importance, the CCSB

(Continued on Page 6)

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Crinkled Test Sheet Blamed for Failing Grade

By Tim Scannell
CW Staff

PRINCETON, N.J. — An errant computer recently added a new wrinkle to the world of No. 2 pencils and fill-in-the-circle answer sheets by nearly keeping a determined student from the law.

Several months ago, Patrick K. Cameron, a graduate of the Georgetown University Law Center, took the Maryland bar examination — a standardized, multistate test administered by the Educational Testing Service (ETS) here. He was informed last April that he had flunked.

However, after finding a "crinkle in the corner" of Cameron's answer sheet, quality controllers at ETS manually scored the exam and found that the aspiring lawyer had passed the computerized test.

A Westinghouse Learning Corp. optical mark recognition (OMR) unit that scans the answer sheets apparently had jammed on Cameron's test during the scoring process. The wrinkled paper covered up some of his answers, and the scoring program in the IBM 3031 connected to the reader gave him a failing grade, according to John Smith, an ETS spokesman.

"We had a malfunction in our scoring machine during the scoring of the Maryland answer sheets for the February administration of the multistate test," Smith said. But, "since a lot of our scores are analyzed and scored through computer processes, we also pick a certain amount by hand, and they're checked manually . . . to ensure that everything is functioning right."

While pointing out that such mistakes are not common, Smith observed that anything can happen "with any kind of a mechanical device through which paper is being passed."

To limit the number of machine scoring errors, ETS employs quality controllers and inspectors to randomly select and manually score some of the approximately 12 million college, law school, graduate record, elementary and secondary exams that pass through the company's computers each year.

Meanwhile, the manually scored Cameron is presently working for a Baltimore law firm. "I just don't know what to say. I'm very happy, to say the least," he stated.

Itel Unveils Two High-End Mainframes

(Continued from Page 1)

ture with 21 nsec cycle time to enhance floating-point, fixed-point multiply and divide instructions.

- System 370 Extended Facility hardware/microcode enhancements combined with IBM's Systems Extensions program products for improved throughput in OS/VS2 (MVS) and MVS/SE environments.
- Virtual Machine Assist for enhanced throughput for VM/370 System Control Program (SCP) environments.
- Advanced Pipeline Control that reduces traverse time from instruction decode to execution to four stages.

The AS/8-7034 consists of a 7034 processor; a 7236 console processor with two color video display monitors and two operator console keyboards; a 7013 hard-copy printer; and two 7237 power distribution units.

The AS/8 processor contains an instruction prefetch processor function, a microprogrammed instruction execution function, high-speed storage control unit with buffer control functions, microcode and software assist functions, console processor function and I/O processor functions.

The AS/8 will be supported by the on-line Advanced System Support Information System Technology (Assist) which, the company said, will offer a teleprocessing link to worldwide technical support centers for on-site programming and field engineering support.

Dual-Processor Complex

Meanwhile, Itel's AS/7-7033 Dual-Processor Complex offers the following level of performance to users of IBM's MVS and VM/370:

- 64K bytes of cache buffer storage with 72 nsec cycle time.
- Main memory access time of 150 nsec.
- Up to 16M bytes of main memory with four-way interleaving and 8-byte data path transfer operation.
- The HSA feature with 36 nsec cycle time.
- System 370 Extended Facility hardware/microcode enhancements.
- Virtual Machine Assist.
- Modular architecture, hardware redundancy and cross-call reconfiguration.

The Dual-Processor Complex contains two instruction prefetch units, two microprogrammed instruction execution units, two storage control units (each with 64K-byte buffer control functions), two independent I/O processor units and two maintenance control units.

The dual processors form a symmetrical image of each other, sharing system resources and allowing parallel processing. One complex will continue to operate if a logic failure occurs in the other, Itel said.

Maintenance can reportedly be performed on a failing dual processor or during a regularly scheduled maintenance session without disrupting processing operations, the company said.

"Basically we are introducing a unique concept of a single-system image, providing a simplified operating environment and enhanced utilization of system resources. The key is the increased utilization of peripherals," a spokeswoman said.

Two Operating Modes

The 7033 processor complex can operate in two modes, dual-processor and uniprocessor. In dual-processor mode, both processors perform parallel operation and share system resources. In uniprocessor mode, operations are performed by assigning I/O processors to the active CPU through the channel cross-call feature.

The major architectural difference between the dual and uniprocessor configurations are the communications function and the channel cross-call feature.

The Dual-Processor Complex consists of two 7033 units, a 7036 console processor with a CRT, light pen and console keyboard, a 7013 hard-copy printer and three 7037 power distribution units.

Calendar

Aug. 24-25, Hanover N.H. — **Data Bases in the Humanities and Social Sciences,** Sponsored by the Association for Computers and the Humaniteis. Contact: Joseph Raben, Queens College, City University of New York, Flushing, N.Y. 11367.

Aug. 26-31, New York — **Share Meeting 53.** Contact: Share, 1 Illinois Center, 111 E. Wacker Drive, Chicago, Ill. 60601.

Aug. 29-31, Zurich — **Ifac Symposium on Computer-Aided Design of Control Systems.** Contact: Ifip Secretariat, Schlossplatz 12, A-2361 Laxenburg, Austria.

Industry Groups Clash Over FTC

(Continued from Page 5)

would be staffed with sufficient technical and operational expertise to identify needed standards, prioritize them, evaluate alternatives and actually develop draft standards for review and comment by knowledgeable experts from both the government and the private sector."

Disclosure Proposed

Biddle also proposed that large computer manufacturers be required to disclose "all internal interface specifications necessary for interconnection of subsystems to their host system."

Ideally, he said, the disclosure should be made "when internal plans are drawn and the product is scheduled for development."

In any case, "the latest effective date must be when a product is given its first public offering."

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Proposal Book Rocks Industry

A California publishing firm has literally taken the computer industry by storm with a recently-published "how to" on proposals. The book, a 256 page volume entitled *How to Create a Winning Proposal* covers every aspect of proposal preparation from start to finish, including the nuts-and-bolts details on how a winner is put together.

Written by two top west coast proposal consultants, *Winning Proposal* is rapidly becoming the standard text for use in both government and commercial proposal efforts. It is currently in use by 74% of the major data communications equipment manufacturers in the nation and 58% of the EDP management and service organizations.

Using a step-by-step instructional technique, the authors provide a virtual roadmap to the entire proposal process . . . including section-by-section checklists to ensure the proposal team of covering all the important bases. Excellent guidelines are given on the contents, format and methods of preparation for both solicited and unsolicited proposals. A tactical approach is used for developing an effective "win strategy," mobilizing the proposal team, and controlling the input of the various team members. Detailed instructions on how to analyze and respond to RFP's, RFQ's, and IFB's are also included.

Copies are available from Mercury Communications Corp., 734-A Chestnut St., Santa Cruz, CA 95060. $52 (prepaid) includes UPS delivery inside the USA. In Calif. add $3 tax. To order C.O.D. call 408/425-8444.

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On In-House Developed DBMS

Livermore Labs Accused of Wasting Millions

By Jeffry Beeler
CW West Coast Bureau

LIVERMORE, Calif. — The Lawrence Livermore Laboratory's Computer Division may have wasted millions of taxpayer dollars by developing a data base management system (DBMS) in-house instead of buying the system commercially, according to a recent Department of Energy (DOE) report.

Evidence suggests "there may be some potential for using commercial software systems" at the lab, auditors at DOE's San Francisco operations office concluded after investigating charges of mismanagement and fraud at the University of California facility.

Pending further investigation by qualified computer experts, the auditors temporarily reserved final judgement on the highly "technical" question of whether the lab developed its DBMS unnecessarily.

In their report, the DOE investigators also cited several other examples of possible improprieties at the laboratory's Computer Division, including misrepresentation of travel expense accounts, errors in annual progress reports and alteration of employee time cards.

Although the auditors uncovered no evidence of fraud at the lab, they did conclude that at least part of the Computer Division was "inadequately managed, and the development work performed by the group was not properly planned and controlled."

Further audits are planned for later this year to decide what remedies, if any, will be needed to tighten control over the lab's time and travel charges.

Former Employee Protests

The investigation into the Computer Division's activities was prompted by U.S. Rep. Fortney H. Stark Jr., who learned of the alleged mismanagement from Dr. Szilard Szabo, a computer scientist formerly employed here.

Szabo had worked for the Information Research Group (IRG), a department of the laboratory's Computer Division. He claimed he was fired for trying to expose the IRG's alleged "questionable practices."

In his complaints to Stark, Szabo criticized the IRG'S software activities and management procedures on 13 points. DOE auditors found four of the allegations valid, two invalid and four partially valid. The remaining three charges were described as "unresolved."

Most of the valid accusations dealt with the IRG's handling of its employee time cards, travel expense reports and annual progress reports. DOE auditors also verified Szabo's allegation that the IRG ignored the findings of two outside consultants who cited several flaws in the group's Master Control Program, a DBMS package.

Procurement Policy in Question

Among the unresolved charges, perhaps the most serious was Szabo's claim that the IRG squandered "millions of dollars" by developing its own DBMS from scratch when it could have obtained a comparable product more easily on the open market.

Although the DOE auditors stopped short of faulting the IRG's data base procurement policies, they did observe that the group's "methodology for software system development may need improvement."

At the same time, however, the investigators acknowledged they lacked software expertise and urged a panel of experts to explore in greater detail the controversy over whether a commercial data base package could indeed have suited the IRG's needs.

In their report, the auditors quoted Szabo as saying the IRG's methods of creating data base management packages "read like a manual [on] 'How Now to Develop Computer Systems.' "

Szabo chastized his former employer for failing to form a committee that would have allowed users and designers to exchange ideas freely throughout the IRG's DBMS development project. Such a "users committee" is crucial to the design of a successful DBMS, the computer scientist purportedly said.

IRG officials, however, dismissed Szabo's criticism by contending they already knew their user requirements and thus had no need for a formal users committee, the DOE report said.

Elsewhere in the document, the federal auditors cited evidence that:

- The IRG sometimes "juggled" and incorrectly reported the charges on its employee time cards.
- The contents of these cards did not always agree with the data on the corresponding employee progress reports.

One employee's time card, for example, falsely credited him with having spent 37 days working on a data base development project for the Department of Transportation (DOT). When DOE auditors later interviewed the employee, they found that he had never participated in the effort and that he suspected his time card had been changed, the report said.

The DOE investigation also uncovered evidence that travel expenses for IRG employees were not always charged to the appropriate accounts.

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California DP Crime Bill Clears Another Hurdle

By Jeffry Beeler
CW West Coast Bureau

SACRAMENTO, Calif. — California's computer crime bill overcame another legislative hurdle last week when the proposed law won unanimous acceptance from the State Assembly's Criminal Justice Committee.

The approval by Assemblyman William McVittee's committee means S.B. 66 has now successfully completed the first four legs of its prolonged journey through the California legislature.

On May 1, the bill scored perhaps its most important success to date when it received the unanimous endorsement of the eight-member Senate Judiciary Committee. Then, on June 4, the Senate Finance Committee informally approved the legislation by forwarding it, without a vote, directly from the Judiciary Committee to the full Senate floor.

Finally, three days after the Finance Committee's action, the full Senate voted 33-0 to approve the bill [CW, June 18].

Now that S.B. 66 has received the Criminal Justice Committee's stamp of approval, only three more legislative hurdles block the bill's way to enactment.

The first of these obstacles will be encountered later this summer when the legislation goes to the Assembly Ways and Means Committee for fiscal consideration. Sources here expect Ways and Means to consider the bill some time in August; because of the committee's crowded agenda, however, the exact data of the hearings is still uncertain.

Proponents of S.B. 66 foresee little if any opposition to the legislation in the Ways and Means Committee, which is the Assembly's equivalent of the Senate Judiciary Committee.

Harmonious Hearing

At last week's hearing, the proposed law passed the Criminal Justice Committee with absolutely no dissension.

On the Books

DENVER — Colorado Gov. Richard D. Lamm signed H.B. 1110 into law last month, making Colorado the fourth state in the country with a computer crime law. The law took effect July 1.

Florida, Arizona and Rhode Island have similar laws on the books, and at least 15 other pieces of computer legislation are pending in 11 states.

On the national level, a federal computer crime bill is currently undergoing debate in the Senate.

In fact, committee members hardly even discussed the bill except to adopt an amendment exempting handheld calculators from S.B. 66's provisions.

Previous S.B. 66 hearings did not always prove so harmonious, however. When the Senate Judiciary Committee first heard the bill on Feb. 27, two opponents from private industry blasted the proposed law as dangerously ambiguous in its intent and phrasing.

They urged committee members to order S.B. 66's terminology clarified lest the bill make felonies of common user practices and treat virtual DP irregularities (using a corporate mainframe to play ticktacktoe, for example) the same as major offenses like wire fraud. They also characterized the bill as "unnecessary" since, they claimed, computer crimes are already covered under existing criminal statutes.

Members of the Senate Judiciary Committee agreed with at least some of the critics' conclusions and instructed S.B. 66's sponsors to clarify the bill's wording. By May 1, the sponsors had made the necessary revisions.

Introduced last Dec. 5 by State Sen. Lou Cusanovich, S.B. 66 resembles S. 240, the federal computer crime bill co-sponsored by U.S. Sen. Abraham Ribicoff (D-Conn.) and currently undergoing debate in the Congress.

If enacted, the California law would outlaw the use of DP equipment for fraud or extortion and would forbid the "malicious" use or alteration of computer hardware, software or data. Individuals convicted under the law would be guilty of a felony and could receive a 16-month to three-year prison sentence, a $2,500 to $5,000 fine or both.

IBM Giving Independents Software Data

(Continued from Page 1)

pendents participating in SIE are much closer to having answers," Keet said.

The significance of that particular point was highlighted recently by John Maguire, president of Software AG: "Even before I signed the [SIE] agreement, as soon as IBM knew I would, it gave me four times as much stuff on DOS/VSE as we'd ever gotten from them on DOS/VS over the years it has been available."

'Not Ultimate Step'

Turnkey Systems is participating in SIE and although Keet doesn't know what IBM does with the material companies like his send it, "we're avidly reading all the stuff they're sending us."

As pleased as he is with SIE in its present form, Keet is still concerned that it doesn't go far enough. "It's a step in the right direction, but it's not the ultimate step. There is a need for an agreement on an exchange of interface information, which is not what SIE is.

"The user will benefit most when we exchange information on how one product does — or could — interface with another. Now that information has to be ferreted out of the information that is generally available — and that is covered by SIE — but we'd like more details up front.

"If IBM would just add a few pages saying, in effect, 'the external interface is expected to be through . . .' the independent vendors would be able to get to work on their linkages much earlier than they can now."

By way of example, Keet cited the recent introduction of IBM's 3310 thin-film storage device. Turnkey Systems' customers asked if their current software could support the unit. Once the SIE material made it clear that the 3310 utilizd Vsam, Keet was able to reassure his clients their programs would work.

Keet was glowing in his praise for IBM's part in developing the guidelines for SIE. He said he had taken part in many meetings with people from IBM's Data Processing Division and each had made "giant steps forward with very little finger pointing and acrimony. We all were asking, "What can we do so we all benefit in this $3 billion industry that is being forecast?'

IBM's intentions are honorable, Keet said, and that view was confirmed by Bruce Coleman, vice-president of Informatics, Inc. and another member of Adapso's ad hoc committee: "IBM expects competition and it's matured enough so it doesn't go out of its way to squash people."

A spokesman for William MacDonald, IBM's director of SIE, seemed deliberately indefinite on several questions, including one on the number of participants, but Coleman said it was a good question and he'd have to ask it at the next Adapso committee meeting in October.

Keet noted, however, that Adapso's first mailing about SIE was perceived as an "information-only type of thing" not requiring any action on the recipient's part. He estimated that only 14 or 16 companies signed up for SIE at that time.

He also estimated that there are some 900 software product vendors, "but only 10% of them could respond effectively to SIE."

Even some of the bigger vendors question the value of SIE to their operations. The orientation of the independent may well be the deciding factor: "Companies working with teleprocessing monitors, operating systems and the like have a life-and-death relationship with IBM," in the view of consultant Burt Grad, who is now on the Adapso committee although he started out on the IBM side of the table.

Application package vendors are generally buffered from system changes, but even they should benefit somewhat from information about IBM's application packages, which are also covered by SIE, he noted.

Although Management Science America (MSA) is an SIE participant, group Vice-President Dennis Voss said he has some reservations about the value of the program to his product line, which is largely application packages.

Even so, he was optimistic about the change of attitude between IBM and the independents exemplified by SIE. "Certainly there is a trend within IBM to be more pleasant to the software industry than it was in the past," Voss said.

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Tag of $1 Million Put on Bank Privacy Rules

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Implementation of the recommendations made by the federal Privacy Protection Study Commission could cost the banking industry more than $100 million initially and at least $50 million annually, according to conclusions based on a recent study.

Commissioned by the American Bankers Association (ABA) Privacy Task Force and conducted by Touche Ross & Co., the study involved visits to 18 banks throughout the country with deposits ranging from $27 million to $3 billion and with zero to 180 branches. The cost estimates for the commercial banking industry were made by ABA staff and industry observers based on the Touche Ross single-bank cost estimates.

The Privacy Protection Study Commission was convened after the passage of the Privacy Act of 1974, which applies to the public sector. The commission's job was to make privacy recommendations pertaining to the private sector.

Bearing the Brunt

One of the major findings of the ABA study was that implementation costs for the commission's recommendations would be borne primarily by retail lending institutions. Such costs could have a "seriously adverse effect" on the future availability of retail banking services — especially loans to consumers and home buyers — and on the ultimate costs of such services to both consumers and banks, according to J.W. McLean, chairman of the ABA's Privacy Task Force.

The study also found that most of the additional costs to banks would be incurred in providing consumers with more information on disclosure policies and adverse credit decisions. The banks would have to revise credit and depository service application forms to include the necessary information.

The most costly individual requirement of any of the recommendations was found to be a one-time mass mailing of notices to bank customers. While the changes would impact banks of all sizes, the study found that larger banks would incur heavier costs because they have more employees to train, bigger customer bases to inform and larger numbers of adverse credit decisions in credit card operations.

Legal Liability

Although the study found that most banks already provide for the majority of the commission's recommendations and therefore would face no direct cost impact, "failure to continue these practices [could] produce a potential legal liability banks do not currently face."

For example, the study pointed out, the banks visited typically had procedures for notifying credit bureaus of inaccurate information furnished by banks when the errors were brought to their attention. "Currently, if an individual bank employee fails to carry out this credit bureau notification, damage may be done to a customer relationship," the study stated. "Under the proposed recommendation, a legal action would be more supportable."

While the federal commission specifically limited the legal penalties for individual noncompliance to a maximum of $10,000, the potential for class action suits still exists, the report noted.

Three Recommendations

In addition to its findings, the report made three recommendations designed to achieve the commission's objectives, but in modified versions and at less cost.

The first recommendation is for the ABA to provide Congress with information on how the proposed legislation might be carried out "to minimize the industry burden." Two of the commission's more costly recommendations require a bank to "notify" current and prospective customers of the uses and disclosures to be made of the information it collects and maintains about them. Notifying each customer in writing accounted for approximately 48% of the total nonrecurring costs estimated in the study.

"Instead, if it were required that only new loan applicants be notified of bank disclosure policies at the same time they applied for services and that information on disclosure policies be provided to existing customers through notices [in] routine mailings sent for other purposes, most of the estimated costs of implementing these recommendations would be eliminated," the report noted.

Another commission recommendation requires a credit grantor to notify applicants of the types of data expected to be gathered about them, as well as the sources of the data. Since most banks anticipate revising their credit application forms to comply with the recommendation, the report suggested a lead time of 18 months to two years to revise the forms, rather than the usual one-year legislative allowance.

The study found that more than one-third of the estimated recurring costs of all the recommendations would result from notifying individuals of the specific items of information that precipitated an adverse decision. Because each case is unique, form letters are not appropriate.

Therefore, the report recommended that banks be given the option of providing the information either in the original adverse action letter or upon request by the consumer once he receives the letter.

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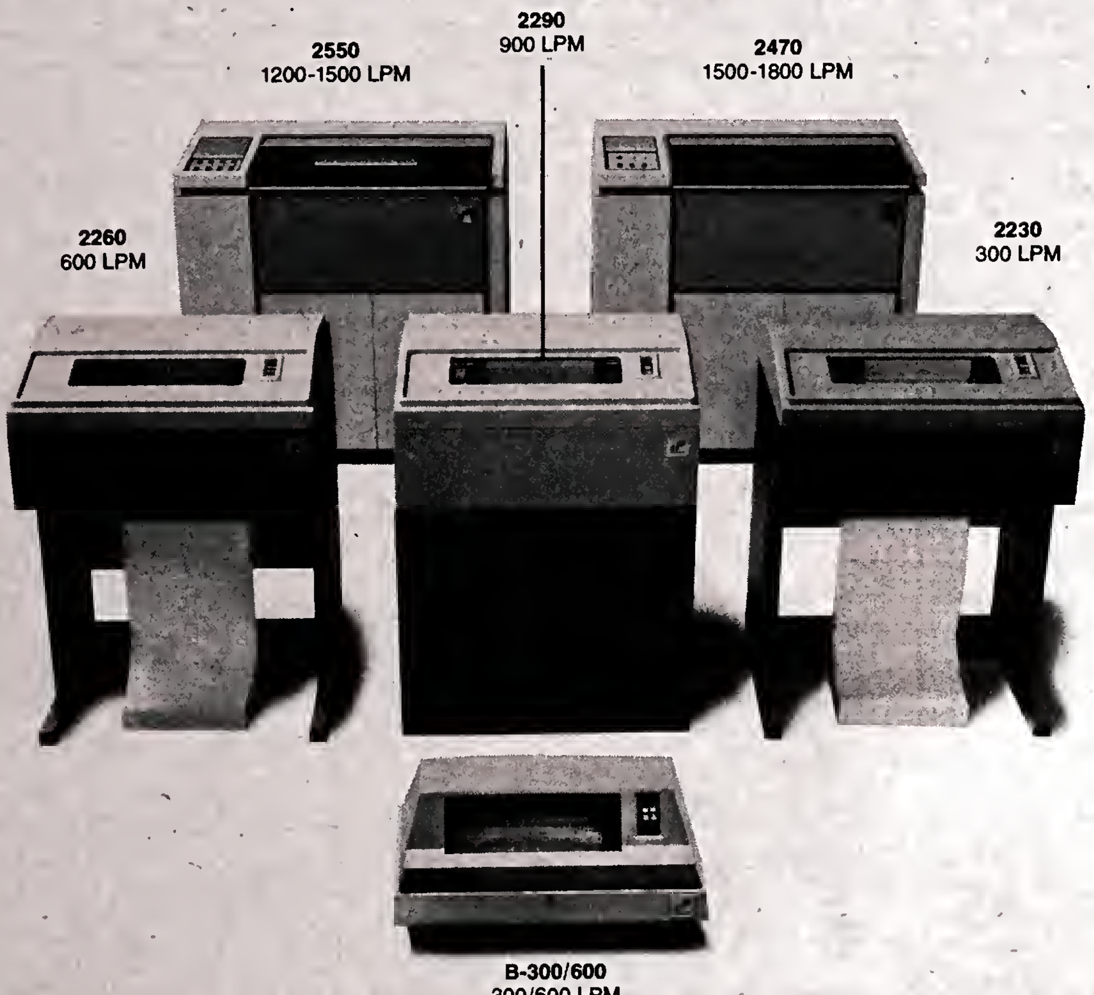

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Relative Performance[1]	2.47	6.9	7	11	11	11.7	12.87	14.3
Memory Size in Bytes (Minimum to Maximum)	256K-768K	512K-1M	512K-1M	512K-1M	512K-1M	512K-1M	512K-2M	524K-1M
Purchase Price[2] (Memory Size)	Not Available	Not Available	$50,180 (512K)	$68,760 (512K)	$81,360 (512K)	$271,260 (1M)	$111,000 (1M)	$140,000 (524K)
Monthly Lease[3] (Lease Term)	Not Available	Not Available	$1,330 (3 Years)	$1,679 (2 Years)	$2,061 (5 Years)	$10,884[10] (4 Years)	Not Available	$4,250 (1 Year)
Memory Cycle Time (Nsec)	120	120	370 Read 440 Write	1,300 (Per 4 Bytes)	1 msec-860 nsec (4-Byte Read) 1 msec-980 nsec (4-Byte Write)	715-935	120	714 (Per 4 Bytes)
Machine Cycle Time (Nsec)	50	50	112	900 (Per 4 Bytes)	500-430	275-1,430	50	Not Available[8]
Channels (Minimum to Maximum)	3	3	0-4	0-2	2-10	3	3-5	7-8
Cache (Buffer) Size	None	None	None	None	None	None	None	None
Bus Architecture?	No	No	Yes	No	No	No	No	No
Price per 1M Byte Of Main Memory	$30,000	$30,000	$20,000	$15,000	$23,680	$75,000	$30,000	$15,000

SYSTEM / CHARACTERISTICS	NCR V-8555M	MAGNUSON M 80/3	NATIONAL CSS 3200	HONEYWELL Level 64 DPS-350	NATIONAL SEMI-CONDUCTOR 400	NCR V-8565M	CONTROL DATA Omega 480-I	NANODATA QMX 250
Relative Performance[1]	16	17	18[4]	18	18	20	21	22
Memory Size in Bytes (Minimum to Maximum)	512K-2M	1M-8M	512K-4M[5]	512K-2M	Revised Specs Unavailable at Press Time	1M-3M	512K-2M	256K-1.5M
Purchase Price[2] (Memory Size)	$88,035 (512K)	$180,000 (1M)	$98,700[6] (1M)	$155,232 (512K)		$140,000 (1M)	$188,000 (512K)	$125,000 (1M)
Monthly Lease[3] (Lease Term)	$2,363 (3 Years)	Not Available	$3,257 (1 Year)	$3,800 (5 Years)		$3,451 (3 Years)	$6,267 (3 Years)	$2,626 (4 Years)
Memory Cycle Time (Nsec)	370 Read 440 Write	600	650	860-680 (4-Byte Read) 980-880 (4-Byte Write)		370 Read 440 Write	400	525 (Per 4 Bytes)
Machine Cycle Time (Nsec)	84	100	250	430-340		56	50	300
Channels (Minimum to Maximum)	0-6	3-6	1-8	2-10		0-6	3-5	2-4
Cache (Buffer) Size	None	None	None	None		None	None	None
Bus Architecture?	Yes	Yes	Yes	No		Yes	Yes	Yes
Price per 1M Byte Of Main Memory	$20,000	$30,000	$24,400	$23,680		$20,000	$35,000	$24,000

The New Mainframe Lineup

(Continued from Page 1)

At about the same time, Burroughs Corp. came out with two medium-scale systems, the B2930 and B3950, targeted to compete with the 4331 and 4341, respectively.

Following a week later was Magnuson Systems Corp., coming on strong in the software-compatible arena with three processors bracketing the 4341 performance range and touted as alternatives to the entire mid-range IBM line from the 370/138 to the bottom of the 370/158 class [CW, March 12].

Said to run present IBM operating systems including 4300 upgrades, Magnuson's M80/32 was ranked just under the 4341 performance range, with the M80/42 and M80/43 topping the 4341 in performance.

Concurrent with those M80 product introductions, Magnuson cut prices of and upgraded its existing M80/3 and M80/4 mainframes. According to the company, the upgraded M80/3 now offers greater performance than both the IBM 370/138 and 4331 and the improved M80/4 gives a 30% greater performance than IBM's 370/148.

CDC on Bandwagon

The next firm to jump on the 4300 bandwagon was Control Data Corp., which added a high-end processor to its Omega 480 series of IBM-compatible mainframes [CW, March 26]. CDC claimed its Omega 480 Model III measured in at performance levels comparable to the IBM 3031 and at 1.3 times the published specs for the 4341.

And, following the pattern of many other IBM competitors, CDC responded to IBM's aggressive 4300 pricing and new two-year lease terms for the series by slashing prices 35% to 47% on Omega 480 Models I and II and by introducing one- and three-year lease terms for all Omega hardware.

Close on the heels of CDC was Honeywell, which brought our four processors — two each in its Level 64 and Level 66 line — said to bracket the IBM 4331 and IBM 4341 in performance and price [CW, April 2]. At the low end, Honeywell aimed the Level 64 Distributed Processing Systems (DPS) at the IBM 4331, ranking its DPS-320 at about equal the performance of the 4331 and its DPS-350 at 70% greater performance.

Targeted against the 4341, the Level 66 DPS-440 was said to rank "somewhat" under the 4341, with the DPS-520 offering about 1.5 times the 440's performance.

The last mainframer to react to the 4300, Univac, chose to unveil its 1100/60 processor series at the National Computer Conference with an announcement the firm claimed was not in reaction to "anything."

Nevertheless, Univac did compare its new line — which included four single-processor and two multiprocessor configurations — to the 4300, claiming the 1100/60 processors range in performance from slightly below the 4341 up to about the level of the IBM 3032 [CW, June 11].

Tough Battle Looms

Few in the industry can deny that IBM's 4300 announcement has shaken up the mainframe market. And while many observers predict the 4300 first-day delivery stretchouts will boost the IBM 370-compatible equipment market in the short-term, most agree that suppliers of IBM software-compatible mainframes will face a tough battle against the 4331 and 4341 once shipments begin.

Evidence of IBM's impact on this market can be gleaned from recent developments at National Semiconductor and Itel. National Semiconductor has all but placed its System 400 — introduced at NCC '78 as a system ranking in performance between IBM's 370/138 and 370/148 — on ice.

The firm claims it is working to "reposition" the system in terms of price and performance

(Continued on Page 12)

CHARACTERISTICS / SYSTEM	IBM 370/148	NCR V-8555MP	HONEYWELL Level 66 DPS-440	CONTROL DATA Omega 480-II	NCR V-8575M	MAGNUSON M80/4	MAGNUSON M80/32	UNIVAC 1100/60 Model C1
Relative Performance[1]	24	27	27	28	30	31	33	33
Memory Size in Bytes (Minimum to Maximum)	1M-2M	1M-4M	1M or 2M	1M-4M	2M-4M	2M-8M	1M-8M	2M-4M
Purchase Price[2] (Memory Size)	$450,300 (1M)	$236,070 (1M)	$198,338 (1M)	$369,000 (4M)	$225,300 (2M)	$295,000 (2M)	$185,000 (1M)	$318,975 (2M)
Monthly Lease[3] (Lease Term)	$18,490[10] (4 Years)	$6,281 (3 Years)	$4,591 (5 Years)	$9,300 (3 Years)	$5,884 (3 Years)	Not Available	Not Available	$6,015 (5 Years)
Memory Cycle Time (Nsec)	405-540	370 Read 440 Write	1,375 Read (2-Word Fetch)	400	370 Read 440 Write	600	600	575
Machine Cycle Time (Nsec)	180-225	84	Not Available[9]	50	56	100	100	116
Channels (Minimum to Maximum)	5	0-12	Up to 18	5	0-8	5-6	3-6	5-14
Cache (Buffer) Size	None	None	None	8K	None	None	None	32K
Bus Architecture?	No	Yes	No	Yes	Yes	Yes	Yes	No
Price per 1M Byte Of Main Memory	$75,000	$20,000	$67,059[11]	$35,000	$20,000	$30,000	$15,000	$30,475

FOOTNOTES

1. Relative throughput based on the IBM 370/158-3 equalling 45. Performance is based on manufacturers' claims at time of product announcement, later adjusted as user benchmarks and experience are reported. Compiled by International Data Corp.'s Information Systems Planning Service in cooperation with Computerworld.
2. For a configuration including CPU, stated main memory, power supply, console and minimum channels (unless otherwise stated) as supplied by manufacturers.
3. Almost all of those firms which chose not to outline their lease prices ("Not Available") said lease plans were available. However, they declined to be specific because of variables in terms and types of leases.
4. The Two Pi Corp. machine configured into a 3200 system with the VPS operating system from National CSS.
5. Can be extended to 16M bytes in OEM configurations with the addition of circuitry. As marketed to end users by National CSS, the present memory maximum is 2M bytes.
6. End-user price including VPS operating system, a 5% software license credit, installation service and three channels as quoted by National CSS.
7. On Amdahl machines, channels come in groups of four; the number can range from eight to 12 to 16.
8. Burroughs refused to disclose machine cycle time.
9. On Honeywell Level 66 machines, the manufacturer stated that machine cycle time depends on individual execution times of the instructions.
10. Reflects IBM's 5% increase in lease prices announced three weeks ago [CW, July 2]. The increase did not affect purchase prices.
11. Honeywell claimed additional memory cannot be purchased separately. This figure was obtained by subtracting the price of the 1M-byte version from the price of the 2M-byte version.

SYSTEM CHARACTERISTICS	NCR V-8565MP	NANODATA QMX 470	IBM 4341	UNIVAC 1100/60 Model C2	BURROUGHS B3950	MAGNUSON M80/42	HONEYWELL Level 66 DPS-520	ITEL AS/3-5
Relative Performance[1]	34	35	37	37	37	40	40	44
Memory Size in Bytes (Minimum to Maximum)	2M-6M	1M-8M	2M-4M	2M-4M	2M-5M	2M-16M	1M-4M	2M-8M
Purchase Price[2] (Memory Size)	$340,000 (2M)	$185,890 (2 M)	$248,760 (2M)	$355,365 (2M)	$230,000 (2M)	$275,000 (2M)	$371,316 (1M)	$600,000 (2M)
Monthly Lease[3] (Lease Term)	$8,457 (3 Years)	$4,584 (4 Years)	$6,069 (2 Years)	$6,705 (5 Years)	$7,200 (1 Year)	Not Available	$8,079 (5 Years)	Not Available
Memory Cycle Time (Nsec)	370 Read 440 Write	495 (Per 8 Bytes)	Not Available	575	714 (Per 4 Bytes)	600	1,375 Read (2-Word Fetch)	920 Read 690 Write
Machine Cycle Time (Nsec)	56	175	150-300	116	Not Available[8]	100	Not Available[9]	115
Channels (Minimum to Maximum)	0-12	3-12	3-6	5-14	7-32	3-16	18-27	5
Cache (Buffer) Size	None	None	None	32K	None	16K	8K	16K
Bus Architecture?	Yes	Yes	No	No	No	Yes	No	No
Price per 1M Byte Of Main Memory	$20,000	$24,000	$15,000	$30,475	$15,000	$15,000	$44,750[11]	$75,000

(Continued from Page 11)

to compete with the 4300. "We're not prepared to make any statement on the 400's performance at this point," a National Semiconductor spokesman said.

According to Dave Martin, vice-president and general manager for National's Semiconductor's Computer Products Group, the introduction of the 4300 delayed System 400 deliveries, originally scheduled for January. Initial System 400 deliveries have now been pushed ahead to third quarter 1979, he said.

While the spokesman claimed "several" 400s are in place at user sites, Martin stated the firm has not yet shipped any of the systems.

Itel Also Reeling

Also reeling from the 4300 announcement is Itel Corp., which has halted production of a number of its Advanced System (AS) Models — the AS/3-3, AS/3-4, AS/4 and AS/5-1 — each of which the firm claims it will upgrade in the field. The company added it will offer its AS/7031AP only on a limited, special-order basis.

To respond to the 4300, however, Itel brought out a new processor in February, the AS/3-5, said to offer up to 22% greater performance than the 4341. And this week, the firm introduced two new high-end processors, the AS/7-7033, targeted against the IBM 3033, and the AS/8-7034, designed to compete with IBM's rumored "H" series (see story on Page 1).

Two suppliers of IBM software-compatible

SYSTEM CHARACTERISTICS	ITEL AS/5-3	MAGNUSON M80/43	CONTROL DATA Omega 480-III	NCR V-8585M	NCR V-8575MP	IBM 3031	ITEL AS/7031	MULTIPROCESSORS, INC. Model 5
Relative Performance[1]	45	48	48	51	51	54	54	54
Memory Size in Bytes (Minimum to Maximum)	1M-8M	2M-16M	2M-8M	2M-6M	4M-8M	2M-6M	1M-8M	2M-16M
Purchase Price[2] (Memory Size)	$1,219,000 (2M)	$315,000 (2M)	$360,000 (2M)	$375,000 (2M)	$510,600 (4M)	$1,000,000 (2M)	$1,294,000 (2M)	$750,000 (2M)
Monthly Lease[3] (Lease Term)	Not Available	Not Available	$12,000 (3 Years)	$9,792 (3 Years)	$13,323 (3 Years)	$26,681[10] (4 Years)	Not Available	No Leases
Memory Cycle Time (Nsec)	920 Read 690 Write	600	400	370 Read 440 Write	370 Read 440 Write	345	460	450
Machine Cycle Time (Nsec)	115	100	50	56	56	115	100	200
Channels (Minimum to Maximum)	7	6-16	6	0-8	0-16	6	7	2-5
Cache (Buffer) Size	16K	32K	8K	None	None	32K	32K	None
Bus Architecture?	No	Yes	Yes	Yes	Yes	No	No	Yes
Price per 1M Byte Of Main Memory	$75,000	$15,000	$30,000	$20,000	$20,000	$75,000	$75,000	$50,000

SYSTEM CHARACTERISTICS	NCR V-8585MP	IBM 3032	UNIVAC 1100/60 Model H1	AMDAHL 470V/5	UNIVAC 1100/60 Model H2	ITEL AS/6-1	AMDAHL 470V/5-II	ITEL AS/6-2	AMDAHL 470V/6
Relative Performance[1]	86	124	124	130	136	137	143	149	177
Memory Size in Bytes (Minimum to Maximum)	4M-12M	2M-6M	2M-4M	4M-8M	2M-4M	1M-16M	4M-8M	1M-16M	4M-8M
Purchase Price[2] (Memory Size)	$810,000 (4M)	$2,077,000 (4M)	$657,040 (2M)	$1,840,000 (4M)	$693,610 (2M)	$1,960,000 (2M)	$1,940,000 (4M)	$2,160,000 (2M)	$2,220,000 (4M, 12 Channels)
Monthly Lease[3] (Lease Term)	$21,139 (3 Years)	$52,160[10] (4 Years)	$12,395 (5 Years)	$42,500 (4 Years)	$13,085 (5 Years)	Not Available	$45,000 (4 Years)	Not Available	$54,000 (4 Years)
Memory Cycle Time (Nsec)	370 Read 440 Write	320	575	325	575	360	325	360	325
Machine Cycle Time (Nsec)	56	80	116	32.5	116	72	32.5	72	32.5
Channels (Minimum to Maximum)	0-16	6-12	5-14	8-16[7]	5-14	6-16	8-16	6-16	8-16
Cache (Buffer) Size	No	32K	32K	16K	32K	64K	32K	64K	16K
Bus Architecture?	Yes	No	No	No	No	No	No	No	No
Price per 1M Byte Of Main Memory	$20,000	$75,000	$30,475	$70,000	$30,475	$110,000	$70,000	$110,000	$70,000

mainframes, Nanodata and Cambridge Memories, have merely renumbered previously introduced systems, making price adjustments and minor performance changes. Nanodata's VMX 200 and VMX 400 now carry the labels QMX 250 and QMX 470, for which prices per 1M byte of main memory dropped from $52,000 to $24,000.

So far, Cambridge Memories has only transformed its models 1, 2 and 3 into the models 1618, 1628 and 1638, respectively. Except for adjustments in prices and machine cycle times, all other specs remain the same.

Similarly, National CSS, Inc. (NCSS) has yet to introduce a 4300 rival, although in May the firm added two specialized processors to its line of 32-bit minicomputers, software-compatible with IBM 360, 370 and Series 30 machines [CW, May 21]. These two latest units are the 3200/Remote, a remote communications-oriented processor, and the 3200/Server, a back-end processor for specialized functions, both virtually identical to the NCSS 3200/host.

Plans later this year are to upgrade its 3200 III processor, currently with the power of an IBM 370/138, to a 3200 V unit, offering the power of a 370/148. The firm refused to give further details.

Finally, Multiprocessors, Inc., has withdrawn its system models 3 and 4 — reputed to fall between the IBM 370/138 and 370/148 performance ranges — in favor of a high-end Model 5 which, the firm said, will equal the performance of an IBM 3031, but won't be available until the first quarter of 1980.

SYSTEM CHARACTERISTICS	AMDAHL 470V/6-II	IBM 3033	ITEL AS/7-7033	UNIVAC 1100/60 Model H1MP	UNIVAC 1100/60 Model H2MP	AMDAHL 470V/7	ITEL AS/8-7034	AMDAHL 470V/8	IBM 3033MP
Relative Performance[1]	200	223	223	248	272	290	334	360	374
Memory Size in Bytes (Minimum to Maximum)	4M-8M	4M-8M	4M-16M	4M-8M	4M-8M	4M-16M	4M-16M	4M-16M	4M-8M
Purchase Price[2] (Memory Size)	$2,320,000 (4M, 12 Channels)	$3,380,000 (4M)	$3,240,000 (4M)	$1,314,080 (4M)	$1,442,075 (4M)	$2,820,000 (4M)	Not Available	$3,020,000 (4M)	$7,140,000 (4M)
Monthly Lease[3] (Lease Term)	$56,500 (4 Years)	$73,900[10] (4 Years)	Not Available	$24,792 (5 Years)	$27,205 (5 Years)	$59,950 (4 Years)	Not Available	$64,450 (4 Years)	$161,786[10] (4 Years)
Memory Cycle Time (Nsec)	325	285	360	575	575	290	336 (Per 32 Bytes)	260	285
Machine Cycle Time (Nsec)	32.5	57	72	116	116	29	42	26	58
Channels (Minimum to Maximum)	8-16	12-16	12-16	10-28	10-28	12-16	12-16	12-16	24-32
Cache (Buffer) Size	32K	64K	64K	64K	64K	32K	64K	64K	64K
Bus Architecture?	No	No	No	No	No	No	No	No	No
Price per 1M Byte Of Main Memory	$70,000	$75,000	$75,000	$30,475	$30,475	$70,000	Not Available	$70,000	$75,000

With Top DPers in Short Supply

Many U.S. Companies Recruiting Overseas . . .

By Tom Henkel
CW Staff

With top computer professionals in short supply, some companies are going outside the U.S. for senior people.

But most companies are finding that getting overseas DPers into the country is a difficult task.

"Immigration is a hassle. You can't get a work permit until you get a job, and you can't get a job until you get a work permit. It's a Catch 22," according to Rich Gardner of Source EDP, a national recruiting firm.

"As far as the eastern side of the country is concerned, it's extremely difficult, if not impossible, to recruit field service engineers — or any person for that matter — from overseas, unless that person is of outstanding ability," according to Brian Webb, personnel operations manager for Digital Equipment Corp.

"Mainly because of the visa problems, we don't recruit into the U.S: We did make a brief study to try to find out what the situation was, and we found getting people into the U.S. is really more trouble than it's worth," Lee Otsubo, a DEC recruiter, added.

"The situation varies in different parts of the U.S.," Webb said. On the West Coast, the rules are not as strict. It depends on where there's a shortage of labor. "On the eastern side, there's no shortage of computer science graduates."

"It depends on the position we're hiring for," Otsubo said. "Our biggest probelm is field service, and there we have residency situations, where we place an American overseas."

However, he added, it's getting harder to find highly skilled computer people. "All of my open positions read: senior programmer, senior analyst, principal marketing specialists — very high-ranking people," Otsubo said.

"We have always grown our people from within the organization. It's just in the last year or so that we're beginning to feel the crunch of the people shortage, and we're beginning to go outside. But we're just talking about the U.S.," he noted.

"The only place we have taken people on a regular basis is from our Australian subsidiary," he added.

Many From Russia

Immigrants from some countries can apparently get into the U.S. more easily than others.

"We tend to get a lot of people from Russia. These are typically Russian Jews who are leaving because they don't get along with the government," Gardner said. "I don't know what they have to do to get out, but there's some pretty good talent. The last one I placed, I got him a $26K job, and he couldn't even speak English."

Gardner, who works out of Source EDP's Boston office, sees "one or two" Russians each month seeking computer-related jobs.

"I easily see more Russians than all other nationalities combined, including Canadians," he said. "I don't pursue them that much because it's hard to get through the technology difference. They tend to get employed in jobs for which they're overqualified, so they lose interest in a hurry and leave to get a real job."

Immigrants from England rank second, according to Gardner. "Immigration status is too hard. They can't get a job unless they're married to a U.S. citizen. Then "it's relatively easy."

Immigrants from Finland rank third, Gardner said.

"But we're dealing with such small numbers; I can't say the sampling is valid. All that is valid from my point of view is that Russians are far and above the biggest influx," Gardner stated.

Larger numbers of Israeli programmers are also starting to immigrate to the U.S. "Typically, they're people who have spent some time in the U.S. and then a substantial time in Israel, and now they're coming back to the U.S.," Gardner said.

Obstacles to Immigration

"Immigrating from the Soviet Union is a difficult proposition. One has to obtain an exit visa for immigration. That often means a wait of at least six months and, for some people, several years.

"Security considerations come into play. If the person has worked in anything even remotely connected to security, there many be a three- to five-year wait," according to James Hess, an officer in the Soviet Information Office, a division of the U.S. State Department.

"A prospective immigrant also encounters other subtle social pressures, including the possible loss of his job, ostracism and immediate expulsion from the Communist Party, if he happens to be a member.

"Jews in the Soviet Union are subject to a lot of pressure and harassment. Nevertheless, many have attained professional status, particularly in technological [areas] such as computers," Hess said.

"So the drive for immigration - [including immigrants and refugees for 1979] is approaching 50,000, an all-time record — has to encompass some of these very skilled, highly educated people," Hess said.

"The Soviets are generally a year or two behind us in the computer area. That would argue for keeping all those people there and training them well and getting them to work on building bigger and better computers.

"I don't have any explanation for why they let these people go, except that they do everything they can to discourage people from applying for emigration.

"It's a pretty oppressive place, but not in the way you think. To flat out prevent all computer specialists from emigrating would involve a form of internal control and totalitarianism that even they would be loath to [institute] in 1979," Hess said.

Most Applications Approved

"Most emigrants who get through the application process are approved. The Soviets argue that 99% of the applications are approved. We don't quibble with that; it's probably true," Hess said.

"The Soviet government tries to hold down the flow by discouraging people from even applying. And once they have applied, [the government] makes it known that their lives, from the point of application until they exit the country several months or several years later, are going to be very difficult.

"So that holds down the overall rate of application," Hess said.

A spokesman for the U.S. Immigration and Naturalization Service (INS) said that according to 1977 figures, a total of 662 immigrants admitted to the U.S. listed their profession as "computer specialist."

Of these, 292 were programmers, 278 were systems analysts and 92 were classified as "other."

A former Consular Affairs worker said immigrants who already work for an overseas subsidiary of a U.S. company have an easier time getting a permanent visa.

"There are certain conditions that have to be met" for approval of temporary or permanent visas, she said. An employee must have worked for the company for a given period of time, and the company must be a subsidiary of or 50% owned by a parent company in the U.S., according to the former Consular Affairs worker.

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Attracted by High U.S. Salaries

. . . For DPers Facing Tough Immigration Laws

By Tom Henkel
CW Staff

Despite the great number of potential immigration problems, there doesn't seem to be a shortage of DPers trying to get into the country. Some DPers apply for temporary work visas and wait for up to two years before they are told whether they will be ganted a permanent visa.

DPers from the UK seem to be the most willing to leave their homeland for jobs in the U.S.

Why? It's easy: money.

"What they're currently earning in England is 6,000 to 9,000 pounds, or $12,000 to $14,000. That same man will get a minimum 30% to 40% increase [in the U.S.]. In a couple of cases we've doubled their salaries," according to Sanford Rose, president of Sanford Rose Associates, a national recruiting firm.

"One man was making about 4,000 pounds a year [approximately $8,000] with a master's degree in computer science. We're bringing him into this country at a salary of $22,000," Rose continued.

According to federal immigration laws, foreign workers cannot obtain an H2, or temporary work visa, unless the hiring company can prove to the Department of Labor there aren't any Americans able or willing to take the job.

If an application is approved, the government grants a temporary work visa based on the length of time the job is expected to last, which is usually a year. After that period, the applicant can apply for an extension on the temporary visa that can amount to an additional year.

After two years, an alien must either apply for a permanent visa or leave the country. According to a spokesman for the Immigration and Naturalization Service (INS), if an applicant has already worked in the country and been forced to leave, his reapplication for a temporary visa will probably be denied.

Once an alien has applied for a permanent visa, he has to wait for a judgement on his application. Visas are given on a first-come first-served basis, regardless of the type of job involved.

In the case of English immigrants, the spokesman said it usually takes between eight months and a year before a judgement is given.

However, according to professional recruiters, getting DPers into the country on temporary visas isn't as hard as it sounds. If the hiring company can prove it can't get Americans to fill the job, approval is usually granted for a one-year visa. Extension of that visa for a second year is considered automatic by the recruiters.

U.S. Companies located in less than desirable areas can get foreign DPers to accept jobs because they don't really know where they are being located, according to Clive Cottle, manager of international placement for National Engineering Resources, Inc.

"There's a location problem. A lot of [Americans] won't relocate to opportunity [sic]. I think [Boston] is pretty well covered. I'm not actively bringing people into this area, but I am to other areas like Virginia and Michigan.

"A company approaches us and says, 'We've been advertising statewide for an analyst for a particular machine.'

They've had problems finding them in the states. They've advertised extensively and used other sources and have come up with nothing.

The U.S. company would then have to prove to the U.S. State Department that the foreign DPers are the only ones available for the job.

"One way of proving this is to produce copies and receipts of extensive advertising campaigns that have failed for no logical reason other than the fact that people are not interested in relocating to work or that a shortage exists.

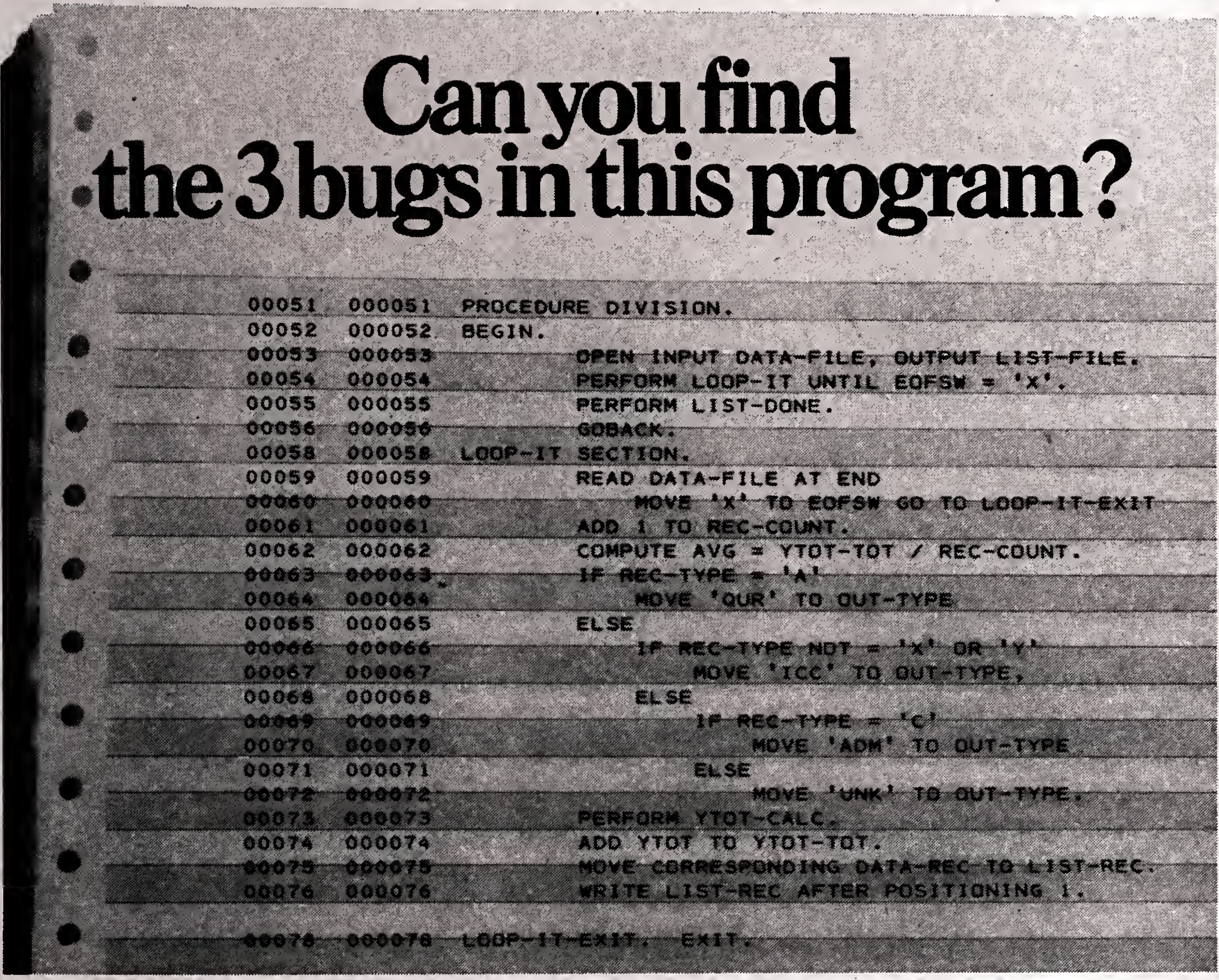
Recruiting from overseas is a good way to find personnel, "but it doesn't necessarily cut your costs. No experienced person is going to work alongside someone making more and doing the same job. It might be an attractive way of getting recruits who don't particularly mind the area or don't know what the area is like," Cottle concluded.

Programmer Katz Working at MIT

CAMBRIDGE, Mass. — A Russian programmer whose struggle to reach the U.S. made headlines last year has settled here and is working at a job in his area of interest.

Boris Katz, who spent three years petitioning the Soviet government for exit visas for himself and his wife, Natalia, became a cause celebre when the couple's daughter Jessica was born in 1977 with a rare digestive ailment, reportedly untreatable by Soviet doctors.

After a lot of publicity upon the family's arrival in the U.S. last winter [CW, Dec. 11], Katz settled here and now works as a researcher in the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology.



Can you find the 3 bugs in this program?

```
00051  000051  PROCEDURE DIVISION.
00052  000052  BEGIN.
00053  000053              OPEN INPUT DATA-FILE, OUTPUT LIST-FILE.
00054  000054              PERFORM LOOP-IT UNTIL EOFSW = 'X'.
00055  000055              PERFORM LIST-DONE.
00056  000056              GOBACK.
00058  000058  LOOP-IT SECTION.
00059  000059              READ DATA-FILE AT END
00060  000060                   MOVE 'X' TO EOFSW GO TO LOOP-IT-EXIT
00061  000061              ADD 1 TO REC-COUNT.
00062  000062              COMPUTE AVG = YTOT-TOT / REC-COUNT.
00063  000063              IF REC-TYPE = 'A'
00064  000064                   MOVE 'QUR' TO OUT-TYPE
00065  000065              ELSE
00066  000066                   IF REC-TYPE NOT = 'X' OR 'Y'
00067  000067                        MOVE 'ICC' TO OUT-TYPE,
00068  000068                   ELSE
00069  000069                        IF REC-TYPE = 'C'
00070  000070                             MOVE 'ADM' TO OUT-TYPE
00071  000071                        ELSE
00072  000072                             MOVE 'UNK' TO OUT-TYPE.
00073  000073              PERFORM YTOT-CALC.
00074  000074              ADD YTOT TO YTOT-TOT.
00075  000075              MOVE CORRESPONDING DATA-REC TO LIST-REC.
00076  000076              WRITE LIST-REC AFTER POSITIONING 1.

00078  000078  LOOP-IT-EXIT.  EXIT.
```

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Ask Congress to Soften Proposals

Law Enforcers Hit Medical Privacy Bills

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Federal law enforcement officials say that they are finding themselves hog-tied by stringent privacy legislation coming out of Congress and that a flood of new proposals make the outlook even worse.

Distressed by their experience with the recently enacted Right to Financial Privacy Act, government officials have asked Congress to soften medical records privacy legislation now under consideration.

Representatives of the Department of Justice and the Department of Health, Education and Welfare (HEW) told a House of Representatives Subcommittee July 9 that the proposed legislation could hamper criminal prosecutions and restrict government efforts to prevent fraud and abuse in federal health care programs.

"Access to medical records can be crucial in many legal proceedings and law enforcement investigations. It is extremely important, therefore, that medical records legislation carefully balance privacy interests against legitimate law enforcement needs," Deputy Assistant Attorney General John Keeney told the House Information and Individual Rights Subcommittee.

Likewise, Francis Mullen Jr., deputy assistant director of the Federal Bureau of Investigation, said, "The FBI makes far less use of information from an individual's medical record than most people might think . . . To my knowledge, there has never been an allegation brought to our attention concerning any FBI misuse of an individual's medical record."

Two Bills Proposed

The subcommittee is considering two similar pieces of legislation, one proposed by Subcommittee Chairman Richardson Preyer (D-N.C.) and one proposed by the Carter Administration, that would provide statutory safeguards for the confidentiality of personal medical records along the lines of privacy guarantees in last year's Financial Privacy Act [CW, Oct. 23].

The Financial Privacy Act and the medical records bills specify steps the government must take to obtain access to personal records. They mandate an individual's right to seek to stop that access and provide specific penalties for failure to maintain the confidentiality of personal information.

Keeney said the Financial Privacy Act has had a chilling effect on criminal prosecutions because some banks, fearing lawsuits under the statute, are reluctant to give the FBI evidence of crimes without a grand jury subpoena. Prosecution in such cases has become time-consuming and expensive, constituting an unnecessary burden on an already overtaxed judicial system, he said.

Ineffective Law Feared

Keeney's statement and supporting testimony by Mullen, of the FBI's Criminal Investigation Division, came under sharp attack from subcommittee member Rep. Robert Drinan (D-Mass.), who said the changes to the legislation proposed by the Justice Department would make the bill so ineffective that it would be worthless.

"I am somewhat surprised at the further eroding of the bill which they are proposing," Drinan said of the Justice Department position. "You people come in here and smear the [proposed] law with a scare tactic that criminals are going free," he said to Keeney and Mullen, demanding they provide information to support their arguments.

Keeney promised to supply statistics gathered by his department on its experiences under the Financial Privacy Act.

'Inconvenient' Privacy

Drinan accused the witnesses of trying "to qualify, to modify, to compromise the bill" in order to "make their jobs easier . . . as I hear it, you people want to get rid of a slight inconvenience to the Department of Justice," he said, referring to the proposed restraints on government access to personal medical records.

Keeney replied that his organization merely wants the bill clarified so that institutions can cooperate with law enforcement authorities without fearing civil or criminal prosecution for alleged privacy infringement.

Keeney was backed by another federal official, Richard Lowe, HEW deputy inspector general, who told the subcommittee, "It is essential for us to retain the right of access to patient medical records. We have invoked our authority sparingly in the past and will continue to exercise it with discretion in the future."

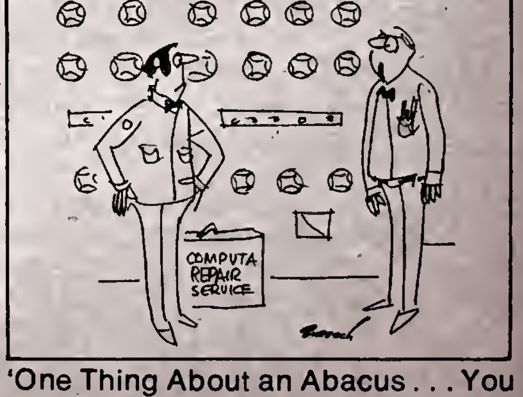
Sympathetic Listener

The government witnesses found a sympathetic listener in subcommittee member Rep. John Erlenborn (R-Ill.), who asked if they were aware of "any widespread, egregious abuses of medical privacy" that make the proposed legislation necessary.

Assured by the Justice Department and HEW officials that they knew of no such widespread abuses, Erlenborn said he is convinced a federal law to protect the privacy of medical records is not needed.

Erlenborn maintained that the recent Louis Harris privacy poll [CW, June 11] showed that the hue and cry for more privacy protection is the result of a misperception on the part of the American public. "We should be legislating in the real world, addressing real problems, rather than engaging in public relations," he concluded.

Preyer told the witnesses they had pointed out "some problems with the bill that were not foreseen when the bill was drafted" and promised that their concerns would be considered when a final version of the legislation is prepared.



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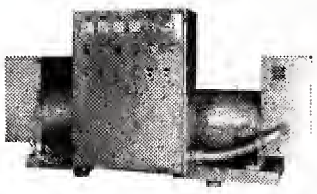

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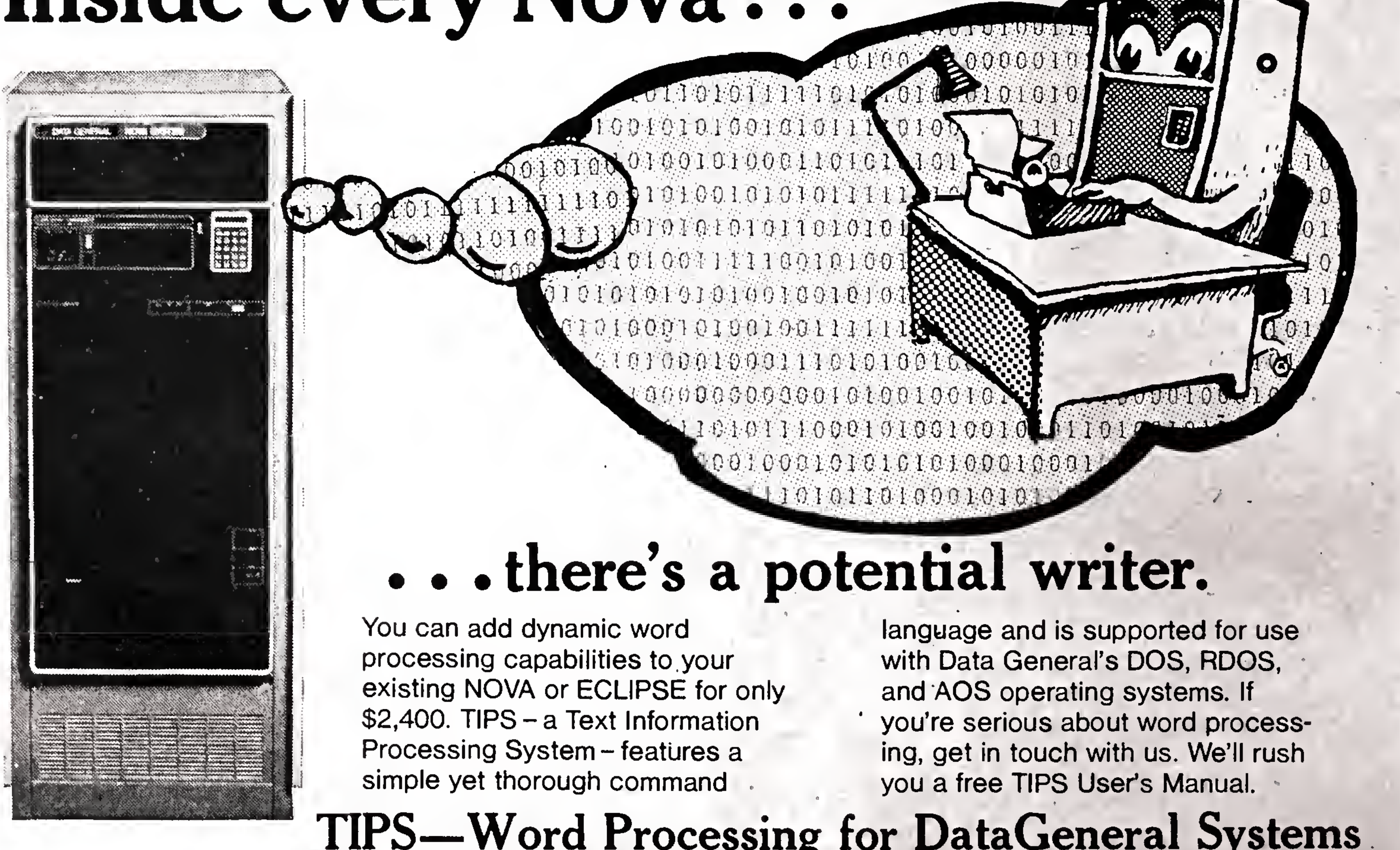

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Safford to Chair NCC '80, Set in Anaheim May 19-22

MONTVALE, N.J. — Herbert B. Safford has been named conference chairman for the 1980 National Computer Conference, which will be held May 19-22 in Anaheim, Calif.

Safford, a technical training supervisor for GTE Data Services, Inc. in Marina Del Rey, Calif., is a past international president of the Data Processing Management Association (DPMA) and served for seven years as an international officer and member of its Executive Council.

Among his conference activities, Safford is a member of the Program Advisory Committee for the DPMA International Conferences, co-chaired the association's 1975 Joint Region 1 and 2 Conference in San Francisco and served as general chairman for the 1966 DPMA International Conference in Los Angeles.

Safford, who has worked for GTE for 25 years, also fostered the structure and implementation of the Institute for Certification of Computer Professionals on behalf of DPMA.

He has served as vice-president of certification and testing as well as chairman of the Certificate in Data Processing Certification Council.

The 1980 NCC will feature approximately 100 sessions covering software, hardware, applications, management issues and social implications as well as a series of one-day professional development seminars, according to Safford.

NCC is sponsored by the American Federation of Information Processing Societies, headquartered at 210 Summit Ave., Montvale, N.J. 07645.

Computerized Mailing Lists Pick Wrong Target

By Ann Dooley
CW Staff

MARQUETTE, Mich. — Computers misfired against the National Rifle Association (NRA) recently when a mailing campaign was aimed at the wrong man.

As part of an ongoing drive for new members, the NRA mailed a temporary membership notice to Orvel (Duke) Simmons, asking him to become a permanent member. Simmons was surprised to receive the invitation — he is currently serving three life terms at Michigan State Prison here for murder, plus about 60 years for other crimes.

The NRA, which claims its membership rolls are not open to anyone convicted of a violent crime, said computerized mailing lists were to blame. Simmons' name could have been on a magazine subscription list or even sent in as a joke.

But this was not the first time that Simmons has heard from the lobbying organization. Several years ago, after Simmons designed some emblem patches for the prison guards' pistol team, the NRA solicited him for membership.

According to Simmons, part of the letter said the NRA "would appreciate your passing our membership information and application on to your shooting and hunting friends."

Managers on the Move

EDWARD B. CODD has been named corporate director of management information services at Hoover Universal, Inc. He will take responsiblity for the company's data services organization headquartered in Jackson, Mich.

Codd, who joined Hoover in February as manager of systems and programming, previously worked as director of research and development at the Commission on Professional and Hospital Activities in Ann Arbor, Mich.

Codd has a bachelor of electrical engineering degree from Manhattan College and a bachelor of science degree from Florida Southern College.

* * *

ROBERT A. DEROUNIAN was recently promoted to the position of corporate director of information systems at Schlegel Corp. in Rochester, N.Y. He will supervise the continued development and operations of the company's worldwide information systems.

Derounian joined Schlegal in 1978 as manager of network systems and programs. Before that he had DP management experience at Ragu Foods, Inc. and R.F. Communications, Inc.

He is a graduate of Hofstra University.

* * *

EDWARD D. WILLIAMS has been elected a vice-president of American Broadcasting Co., in New York City with a continuing responsibility for all DP services for the corporation and its subsidiaries.

Williams was previously vice-president of management information systems at ABC, a position he held since 1972. Before that he served as director of systems and DP since joining the company in 1970.

Williams is a graduate of Hofstra University, where he majored in industrial management.

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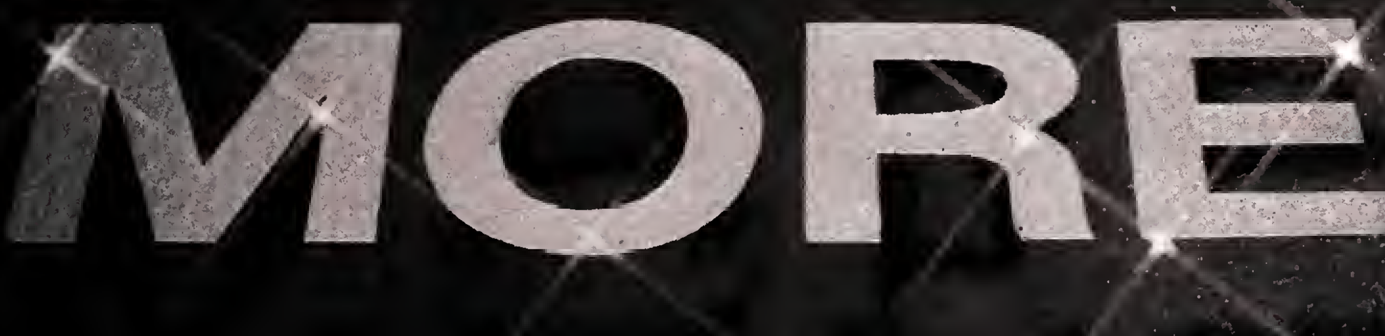

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Newsletter Offers Tips on Software Contracts

WINTER PARK, Fla. — "Under no circumstances should the user sign a primary software agreement that merely promises that the specifications will be 'mutually agreed upon' at some later stage of the development process."

That is one of several tips recently offered by "Computer Negotiations Report" (Volume 3, Issue 2) on the special risks inherent in software contracts.

As part of its "Tip of the Month" feature, the newsletter stated that applications software contracts, contrary to most current practice, must contain detailed specifications, including runtimes and "other resource usage and performance criteria."

However, if the necessary information is not yet available, the user should sign a separate contract providing for the development of the program specifications.

The only time a user should sign an agreement that promises future "mutually agreed upon" specifications, the newsletter warned, is when the contract permits the user to cancel at no loss if the developed specifications prove unacceptable.

In addition, the user should try to specify the level of vendor personnel support and the qualifications of the vendor staff assigned to the project if such factors could be critical to the success of the project.

Issue of Payments

The user should also minimize progress payments payable under any development or conversion contract, since many software firms are "small and undercapitalized," according to the newsletter. When such payments are necessary to ensure the vendor's liquidity, however, the user should try to tie the payments to "clearly defined steps" and, if possible, to the delivery of documentation or other tangible results.

"Although the legal protection afforded proprietary software is less than perfect," CNR noted, "the software vendor may face an infringement claim from another source." Therefore, it advised, the user should ensure that the agreement provides for the vendor to warrant title to the software and agree to indemnify the user in the event an infringement claim is filed.

Furthermore, the software agreement should include firm delivery deadlines, the newsletter stated.

As for program acceptance, the detailed program specifications, including runtimes, "must be carefully incorporated into the acceptance section of the agreement." This will help the user maximize the size of the post-effective payment under the contract in order to reduce its losses in the event the program fails and the vendor cannot return progress payments previously made by the user.

Matters to Clarify

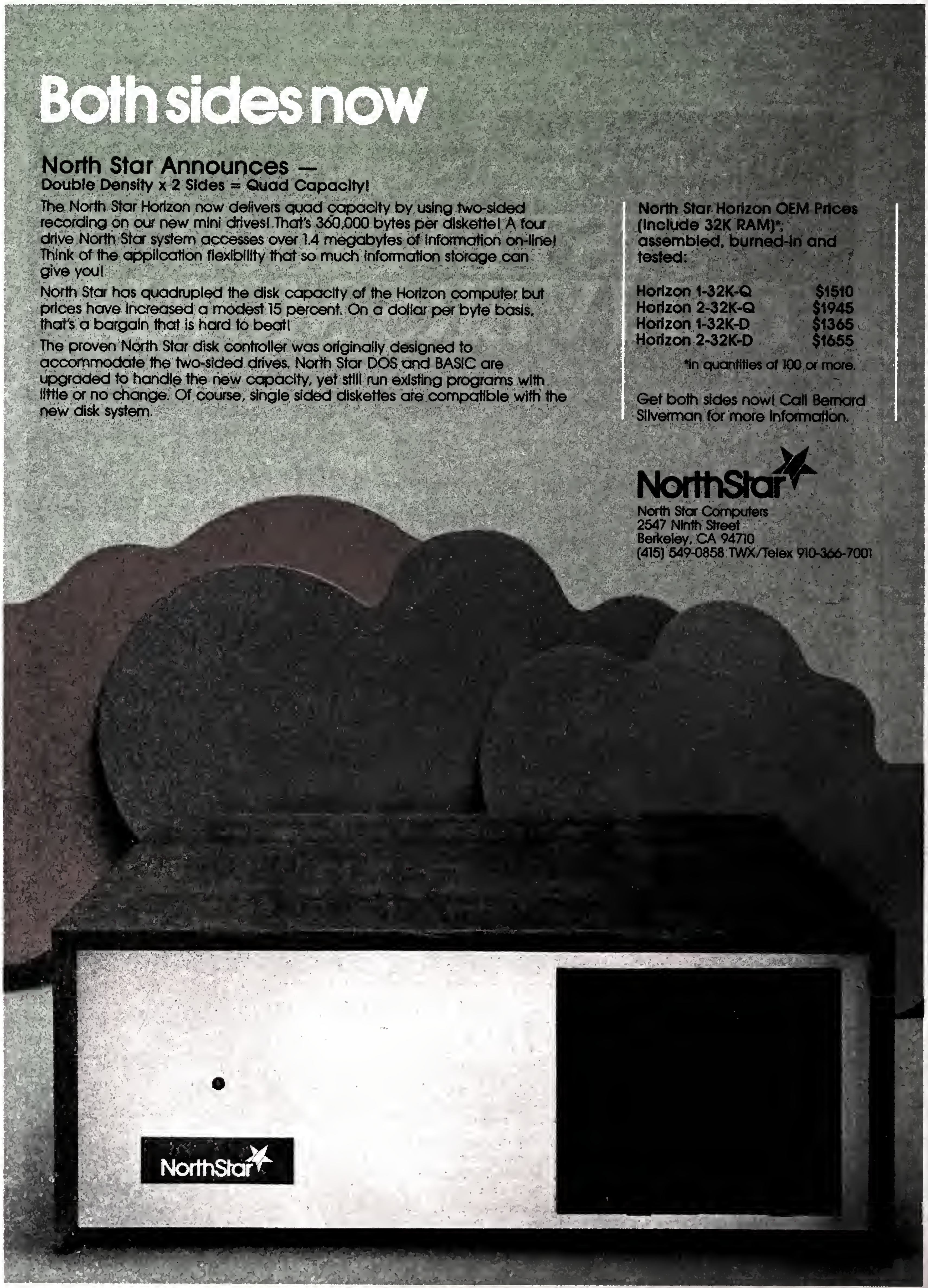
To provide maximum legal protection to the vendor, most software is licensed to the user. The user should make sure the agreement adequately describes his rights under the license, the report said.

Matters that should be clarified include the license term, the user's ability to duplicate tapes and documentation, the user's ability to utilize the software and documentation at multiple user sites and user assignment rights (including transfer and sublicense rights).

Lastly, the agreement should "carefully specify" the vendor's continuing obligation, if any, to provide maintenance and fixes for the software (indicating minimum vendor response or correction time and the price, if any).

In addition, the contract should describe the minimum period of vendor support and the user's rights to any future "upgrades."

CNR is published by International Computer Negotiations, Inc. here.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See Page 118

Strikes Out at Lack of Planning

GAO Hits Purchases of Unneeded DBMS

WASHINGTON, D.C. — Inadequate planning by federal agencies before acquiring data base management systems (DBMS) is probably leading to substantial purchases of unneeded data processing resources, according to a recent government report.

After an in-depth study, the General Accounting Office (GAO) reached the conclusion, probably all too familiar to the private sector, that "if not properly planned and controlled, the [DBMS] can be complicated and costly, providing management with more problems than solutions or benefits."

In most instances, the GAO said, "organizations do not save data processing dollars by integrating files and implementing data base management systems, primarily because of increased costs associated with a more complex system."

In fact, "The costs of acquiring data base management systems are generally insignificant compared with the costs involved in using them in what is technically known as a 'true data base environment.' "

In its study of government experience with DBMS, the GAO scrutinized 18 civil and defense agencies that have acquired or were in the process of acquiring a DBMS. The conclusions of the study are detailed in a report entitled, in classic bureaucratic understatement, "Data Base Management Systems — Without Careful Planning There Can Be Problems."

Only Six Surveyed Users

The report calls for a planning process that includes "comprehensive studies of user requirements, feasibility, cost-benefit analysis and detailed implementation planning to minimize the adverse impact that the data base approach can have on an organization."

Only six of the agencies visited by the GAO during its study had surveyed user requirements before acquiring a DBMS. "As a result, substantial amounts of money may have been spent for [DP] resources that were not needed," the report said.

One agency made a DBMS acquisition based only on "the data processing center director's desire to offer users the latest [DP] technology." After spending more than $1.2 million, the agency had a DBMS whose use now accounts for only about 5% of the processing workload — a figure not expected to increase soon.

Only one of the 18 agencies had performed a cost-benefit analysis before deciding to acquire a DBMS. The GAO was told by a number of the agencies that the relatively low cost of a DBMS precluded the need for formal analysis.

However, the report noted, "the acquisition cost of a DBMS appears to be relatively insignificant when compared to the long-term commitment that an agency must make to application software, computer hardware, communications, procedures, training and support."

An analysis that weighs all the costs and possible benefits "is an indispensible prerequisite," the report stated. "Without such an analysis being made . . . agency management is asked to approve a long-range, high-cost project on the basis of incomplete information or spurious justification and therefore cannot be assured that the most appropriate economical and effective [DP] resources will be obtained."

DBMS for File Access

Most of the agencies surveyed also had not developed an adequate DBMS implementation plan. Eleven agencies continue to operate with traditional file-oriented processing techniques and use the DBMS primarily as an improved file access method.

"At many of the agencies," the report added, "the DBMS accounted for only a small portion of the total data processing workload."

Because of this minimal DBMS usage, whatever data base administrator functions the various agencies had established were generally inadequate, with the administration staffs lacking authority and responsibility. Additionally, insufficient staff training, user education and internal auditing procedures plague the agencies' DBMS experiences, the GAO said.

The GAO report called for more direction from the General Services Administration, which is charged by law with overseeing government DP acquisitions. "Present procedures focus on the competitive procurement of computer hardware," the GAO noted, recommending a new policy that will allow DBMS software and compatible hardware to be procured jointly.

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System Use Seen Less Effective in Big Concerns

By Tom Henkel
CW Staff

NEW YORK — The bigger the organization, the less effectively its computers are used.

That is the opinion of Walt Scacchi, a research assistant for the Irvine campus of the University of California.

A number of problems develop when computers are used in large organizations. One of the biggest, Scacchi said, stems from the fact that the people who use computers the most aren't always aware of their limitations.

"The user often doesn't comprehend the problems in trying to maintain the wants and needs of personnel," Scacchi said at a recent conference here. Commercial organizations often fall behind in updating software packages because they do not have specialized personnel to look after company software.

Managers, who have the power to order a software update, often have too little time or experience to do so, Scacchi added.

Another social consequence of running a large computer system is the development of political situations. Programmers responsible for making software updates often do so on a selective basis, creating a software backlog in some areas of the company.

Keeping Tabs on System

One way of keeping tabs on the progression of large systems is through the Accomplishment Value Procedure (AVP), according to its developer, Digital Equipment Corp. internal staff consultant Donald J. Aharonian. A directional and status reporting tool, AVP has proved successful in system development. AVP develops a series of "milestones" for system growth. It then creates a timetable for the achievement of each milestone and issues periodic reports on the status of a given project, Aharonian said.

AVP also provides greater control of existing systems, because the same basic procedures can be used to monitor changes to the system, according to the DEC consultant.

One of the biggest computerized organizations in the world is New York City. Sally Rupert, city manager of financial planning, said the city's computerized system, activated in 1977, didn't come easy.

Efforts to bring more than 100 city agencies and 200,000 employees into one data base proved to be a task that would cost $20 million and take almost two years to complete.

Rupert said the project's two-person steering committee, made up of director David Woodrich and Stephen Clifford, decided to implement the system in 18 months.

Rupert said the steering committee concluded that if the program was not implemented inside of two years, the system would be outdated before it got started.

Five Consultants

To aid in the design of the system, New York City hired five consulting firms, which returned 32 two-inch-thick binders with documentation of the design phase of the system.

At that point, the task force took control of the project, and the system officially went into effect in July of 1977.

A computerized payroll system, which was eventually tied into the citywide IBM 370 system, was delayed until city officials were sure the payroll would be distributed without a hitch, Rupert continued.

"If you don't pay workers in New York, you have havoc," she said, speaking of the strong union control in the city. The payroll system was phased in over a six-month period.

"It proves you can take something as messed up as New York City and put it into a system. If you've got the government money behind you, you can do it," Rupert said.

Rupert urged other large organizations thinking of installing a centralized computer system to use proven hardware and software. She added companies should also look toward using software that can be updated to serve changing needs.

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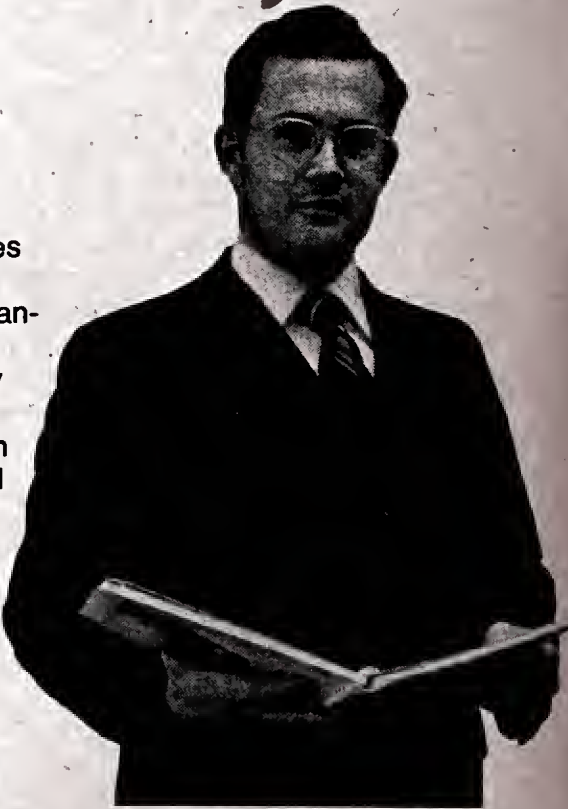

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Auditor's Role in System's Total Life Stressed

DENVER — DP auditing has come a long way from making sure that the right doors were locked and punched cards were input properly.

Now auditors not only review and check on a computer system's integrity after a job is run, they also aid in the system's original design, implementation and modification, according to Glen W. Belden, vice-president of the Computer and Communications Services Division of United Airlines.

Delivering the keynote address at a recent conference here of DP auditors, Belden pointed out that a certified audit plan — overseen by the corporate controller — is an important part of total system development. The timing of the role of the auditor is critical throughout the life of the system to avert problems that may occur because of bad decisions made earlier.

Highlighting some of the DP activities at United Airlines, Belden noted the constant partnership between the computer system's developers and the auditing department. The opinions of United's auditors are considered a "formal" part of systems development and are actually used to discern how close the original design of a project comes to final implementation.

The auditors also serve to raise questions on how secure the system ultimately is and whether the system will contribute to the business process as a whole, Belden stated.

At United Airlines, the DP department uses a two-step approval process that "is not colorful but does the job," Belden said. First, the designers get the initial idea, outline the steps toward it, list the benefits and cost and petition for final approval. The direct users of the proposed system then define their functional requirements and tell what is expected of the system.

User auditing of a proposed product not only helps define just how the technology should be applied, but also allows the user to be accountable for final business results, Belden commented. If the final system isn't acceptable, the user has only himself to blame.

Since United has one of the largest telecommunications systems in the world — controlling reservations, company operations, ticketing, credit approval and even the recent dispensing of airline discount coupons — it relies heavily on phase-by-phase interdepartment self-audits. Paper is no longer used in United's DP function except to give the customer something tangible to hold onto, so auditing has to be involved in the entire operation, Belden said.

In addition, since auditors are not pressured by budgetary restraints and on-time qualifications like the DP manager or designer, they can offer a fresh outlook on a computer project and hopefully add to the whole system.

Acpa Meeting To Showcase Software

WASHINGTON, D.C. — A "Software Showcase" featuring technical presentations by major software suppliers will highlight the ninth annual conference of the Association of Computer Programmers and Analysts (Acpa) here Oct. 22-24.

About a dozen software package and computer service vendors will describe their products in structured presentations beginning every hour on the hour during the first two days of the conference. Attendees will receive product information at each session.

The theme of the conference is "Preparing Today for Tomorrow's New Technologies." More than 20 seminars will be presented on topics ranging from trends in systems technology to new methodologies for sharpening the professional skills of systems analysts and programmers.

The keynote speaker will be Dr. J. Daniel Couger, professor of computer management science at the University of Colorado and the U.S. Computer Science Man of the Year. Couger will present his latest survey results in an address entitled "Key Factors for Motivating Programmers and Analysts."

More information on the conference is available from Ken Burroughs, DBD Systems, Inc., 1500 N. Beauregard St., Alexandria, Va. 22311.

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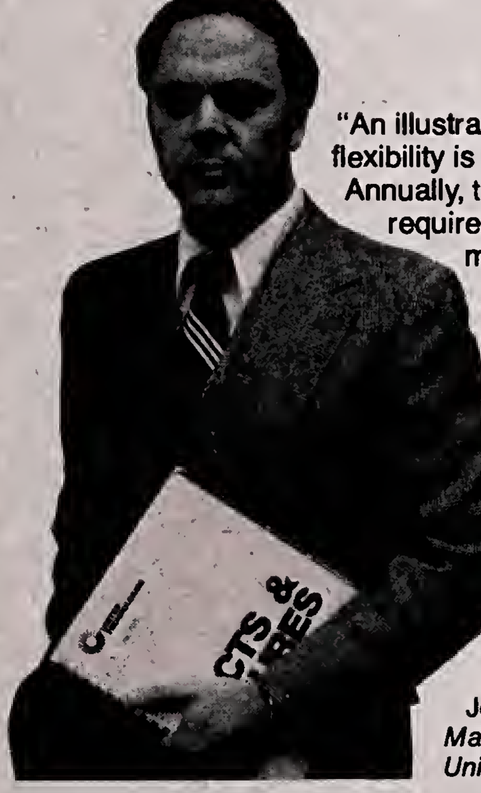

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Robbing a Bank — Backward

By Connie Winkler
CW Staff

NEW YORK — Designing cryptographic key for data is like planning to rob a bank — only backward.

Figure out how many betrayals to the opposition and abnegations of cryptographic key information there can probably be, then figure out how many vaults and guards there need to be, G. Robert Blakley of Texas A & M University said at a recent conference session here.

If the public is now concerned about data security with electronic funds transfer, think what will happen with electronic mail and the need to verify signatures, Blakley said. He told of a bank which has its cryptographic key in four vaults in two different cities. Certain combinations of vaults and cities are necessary to actually use the key to decode data.

Blakley argued that organizations need more than hardware devices to encrypt and decrypt information within the read/write heads of disks upon which data is stored. When toyed with by the "opposition," the encrypt facility evaporates.

Eric H. Michelman, now with Intel Corp., talked about his past work at MIT on the design and operation of public key cryptosystems (PKCS).

The keys are not so much public as secure, Michelman said, so they can be given to a registered third party. This would be necessary as in the example of two parties using telecommunications to sign a contract. The third party would hold the key to ensure that each party actually signed the contract.

Michelman also recommended that organizations:

- Limit the lifetime of their public keys. If they crack the key after use stops, it doesn't matter.
- Change keys when an employee with access goes to the competition.

Multitude of Flaws Cited In Most Firms' DP Security

By John Whitmarsh
CW Staff

NEW YORK — "Terrible" contingency plans, relaxed access controls and enhanced opportunities for fraud characterize the state of computer security in most U.S. companies, according to a computer security consultant.

Robert V. Jacobson, president of New York-based International Security Technology, Inc., presented that assessment here at a recent conference seminar on managing computer security.

Only the physical security of computer hardware is improving, Jacobson said. But unless further gains are made in this area, a major wiretap-based fraud will occur within five years, he predicted.

The status of contingency planning today is "terrible," Jacobson said, adding "that is too kind a word to describe it."

Jacobson said that most DP facilities are not prepared to deal with a major disaster because the complexity of computers and reliance of business upon them make working contingency plans difficult and time-consuming to formulate.

Jacobson predicted that at least one large company will go bankrupt within five years because of a computer disaster and the lack of a contingency plan.

The information access controls on current hardware and software systems "do not present serious impediments to determine intruders," Jacobson said, adding that the situation is not likely to improve in the near term.

Unprotected Minis

Jacobson predicted that the "exploding use of unprotected minicomputers will cause a rash of information thefts. Industrial espionage agents will have a field day."

Relaxed information access controls also provide little deterrent to those who would alter computer hardware during its manufacture, in some cases by the simple substitution of one microprocessor for another, Jacobson said.

The opportunities and rewards for fraudulent computer use "are clearly increasing as business applications also increase," Jacobson said. "But the risk of discovery *and* punishment is increasing only slightly."

As a result, Jacobson predicted that losses of $10 million will be — or already are — commonplace.

Jacobson stated that computer security management has been largely ineffective in the past because of an unprofessional approach and the lack of DP management support. Better understanding by top management and a new commitment by DP managers are brightening the security picture, he said.

Upcoming Developments

What's coming up on the computer security horizon? Jacobson sees four developments:

- Better techniques for assessing risks and allocating security resources. "Guesswork is no longer acceptable," he said.
- Gradual increase in top management support.
- Modest efforts to build more secure hardware.
- No change in human nature, which means that computer security efforts must be ongoing.

More emphasis on the behavioral aspects of computer security are required, Peter S. Browne, president of Computer Resource Controls, Inc. of Rockville, Md., agreed.

"The issues of computer security are not rooted in technology but in behavioral sciences," Browne told the NCC seminar attendees.

Browne noted that the centralization of the DP function "is alive but not well, and distributed processing is the road ahead. But distributed systems mean distributed risks, and security measures will be less effective."

Line encryption may or may not be one answer to securing distributed processing systems, Browne said. "Line encryption is not as readily available as some vendors would have us believe," he said.

Moreover, in the distributed processing systems of today and tomorrow, "few persons are willing to take individual responsibility for the security of the entire system," Browne said.

One solution might be in matrix management, where wide coalitions of individuals in different corporate functions oversee computer security. This shifts the responsibility for one man to many, enhances corporate awareness of the problem and increases the odds of detecting a security violation, Browne added.

Others parts of the solution ought to include a greater emphasis on computer security training, the establishment of security standards and "designed-in" security measures in both hardware and software, Browne suggested.

"Computer security," he concluded, "is a management problem, and it's amenable to a management solution."

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For Use in Office of Future

Users Found Wary of Multifunction Equipment

By Marcy Rosenberg
CW Staff

SADDLE BROOK, N.J. — Multifunction equipment (MFE), expected to grease the path to the office of the future, may hit a few detours along the way to acceptance by small user organizations.

Based on a national survey of 300 such users — mainly insurance agents and electronic equipment manufacturers, each employing 500 or fewer persons — Input, a market research firm, found users perceived two key drawbacks to MFE.

- An equipment failure could impair many operations within the organization.
- Initial equipment costs would be high because the MFE purchase is often based on future, not immediate, needs.

As defined by Input, the MFE concept is the addition of a second information processing capability to systems presently in use, such as small business systems, text processing equipment, copiers and public automatic branch exchange (PABX) units.

For example, a small company planning ahead might want to add text processing functions to its small business computer, although it would not be able to use these added capabilities until some future date. This was the case for most users surveyed, and the consensus was a concern that "the cost-effectiveness of MFE would not be realized immediately," according to Ely S. Lurin, an Input vice-president.

Despite these reservations, users and vendors alike are eyeing MFE as the means of implementing the office of the future. The study reported that small user installations appeared ready to welcome certain multifunction equipment services as a way to reduce personnel costs and improve information processing at their sites.

Interviews with 12 "billion-dollar" equipment vendors showed that manufacturers plan to jump into the MFE market, but only by expanding present offerings — not by entering new product areas.

Evolution of MFE

These findings led Input to forecast the evolution of six MFE categories:

- System No. 1 — a small business computer with the add-on function of text processing, a logical entry from companies such as IBM, NCR Corp. and Digital Equipment Corp.
- System No. 2 — a shared logic, multistation text processor with add-on DP functions, predicted or already available from Wang Laboratories, Inc., Burroughs Corp./Redactron and 3M Co.
- System No. 3 — an office copier with add-on facsimile and output computer printing capabilities — a natural for Xerox Corp. and Kodak.
- System No. 4 — a PABX system with add-on functions of text and data processing, expected from Northern Telecom Ltd. and ITT.
- System No. 5 — addition of information processing to a communications service, a likely extension of service from value-added carriers such as Telenet Communications Corp. and Tymnet, Inc. (if regulatory agencies allow).
- System No. 6 — addition of communications services to time-sharing, predicted from General Electric Co., again barring federal regulatory restrictions.

User Choices

Asked which systems they would consider buying, the majority (76%) chose System No. 1 because, according to Input, it was familiar and most users "attribute capabilities of assuming additional function to a computer."

The next largest number of users (44%) selected System No. 3, the copier with add-on facsimile and output printer.

Combined communications and information processing systems were relatively well accepted; System No. 5 and No. 6 were both chosen by 39% of the user sample. The Input report predicted that more users would consider these systems if the Federal Communications Commission approved combined network and processing systems.

Less readily accepted were System No. 2 (37%) and No. 4 (34%), because users generally do not attribute information processing capabilities to text processing or PABX systems.

Although the survey was for many users the first introduction to MFE, a large number of respondents said they were willing to pay "reasonable" amounts for the equipment.

Approximately 21% said they would pay at least as much for System No. 1 as they would for one text editor and a separate small business computer. Some 63% answered similarly for System No. 2, as did 29% each for System No. 3 and No. 4.

While most users asked to save costs for MFE, the discounts desired were low, ranging from 10% below current costs for System No. 2 to 20% for System No. 1 and No. 3.

Entitled "Multifunction Equipment in Small Establishments," the study costs $4,000 from Input at Park 80 Plaza West-1, Saddle Brook, N.J. 07662.

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Publication to Start Up

BETHESDA, Md. — A publication listing DPers with expertise and DPers needing assistance will start up later this summer.

The newsletter, "Computer Consultant," will list the qualifications of subscribers with experience in different aspects of computing. In a separate section, persons or organizations needing assistance can list their requirements.

"Computer Consultant" will be edited by Eric Balkan, a systems programmer with eight years' experience in everything from mainframes to microcomputers.

The subscription cost of $15/year entitles each subscriber to one free listing per issue. More information is available from Battery Lane Publications, P.O. Box 30214-P3, Bethesda, Md. 20014.

System Helps Federal Botanists Identify New Varieties of Plants

By Tom Henkel
CW Staff

BELTSVILLE, Md. — From the valley of the jolly green computer? Don't laugh; many new plant varieties are being identified by computer here.

Examiners at the Plant Variety Protection Office of the U.S. Department of Agriculture are using an IBM 370/168, along with a software package called Easytrieve from Pansophic Systems, Inc., to award patents on new crop strains.

"We keep up-to-date files for each crop. In each of these files we have all the publicly recognized descriptions for various plant varieties.

"When we receive an application on a new variety, the applicant has to demonstrate that his variety is indeed new," said plant examiner Doug Bailey.

If a plant is judged to be new, its developer can obtain a 17-year patent on that variety.

Bailey said the computer is used to narrow down the varieties of known plants to a few with qualities similar to those of the applicant's.

This small group of plants is then analyzed by staff botanists to determine whether a new strain of plant has been discovered.

"The problem is that in some crops, you may have well over 1,000 recognized public varieties. What [the examiners] have to do is to eliminate those that are clearly distinct and different."

Baily added the Plant Variety Protection Office currently has over 60 different species of crops on file.

Search for Software

When it was formed by Congress in 1970, the office hired a private consulting firm to find the best software system for interfacing with the Department of Agriculture's IBM 370/168, located in Washington, D.C.

The only thing they learned was what they could not use. "The systems [the consulting firm] proposed would have been inadequate in a number of ways.

"At that point, we just began to search on our own. Rather by accident, someone said, 'How about using this thing called Easytrieve?' We looked into it, and it's just been perfect. It's been ideally suited to our needs," Bailey said.

Experience Unnecessary

One of the biggest advantages of the Easytrieve system, Bailey said, is that the 12-person staff, comprised of botanical scientists, can use the system without previous DP experience.

"The Easytrieve software system has been so easy for us to use that we can bring in a botanist and train him how to use the computer, as opposed to [hiring] a computer specialist, whom you could not train properly in botany," according to Bailey.

It takes about two weeks to learn to use the system, he added.

"They're constantly updating the software package. It's become more and more flexible and more adapted to our needs.

"There were some restrictions in the beginning as to the number of fields you could define in each record. Originally that was a problem, but now [we can define] about 1,000 [fields], and we only use about 500."

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Status Symbol at Merrill Lynch? A Terminal

By Tom Henkel
CW Staff

NEW YORK — Next to the key to the executive washroom, one of the real status symbols at Merrill Lynch, Pierce, Fenner & Smith, Inc. is access to the company data base.

About 12 of the stock brokerage firm's top executives have CRT terminals in their offices that give almost instant access to personnel and payroll information, profit-and-loss reports and budget performance data on each of the Merrill Lynch branch offices.

Using an IBM 370/168, company executives who include the chairman of the board, two presidents, five executive vice-presidents and chief financial officers can save days and sometimes weeks of waiting for subordinates to research and prepare written reports, according to Gerald Ely, vice-president in charge of communications.

The company created the executive data base in about four months by pooling and modifying existing company programs on the 370.

"Initially, it was just a matter of establishing files. We used IBM's Display Management System [DMS], which runs on CICS. It's like IBM's Video-370; in fact, we replaced some Video-370 applications with it," Ely said.

The system is basically a search and analysis system in which information is stored and the IBM software recovers it. "We made some basic changes [to the IBM software]. We used exits and wrote our own code. We used [IBM's] access methods, and we wrote our own Cobol exits for processing information, formatting some screens and doing some calculations. But we let DMS do the gathering and formatting in most cases," according to Ely.

"These are raw numbers we're talking about, actual performance. It's all very objective. Everything is based on what we've done the day before; there's no guessing," Ely said.

The system is not used for modeling or forecasting applications.

As far as upgrading the system, Ely said, "There aren't too many more data bases that would be meaningful. The business of the firm is in there." There may be some minor additions to the 150 existing programs on the system, but no major upgrades are necessary.

Worth the Expense

How much did it cost? A spokesman for Merrill Lynch said implementation of the data base cost just under $100,000, but company officials seem to think it was worth it.

Although the system didn't cut the need for personnel, it has saved time in reporting management, Ely pointed out.

"Management can ask any question against the data base and get answers in minutes," Ely said, adding that some queries can take as few as 30 seconds.

Burrows Named As Director Of NBS Institute

WASHINGTON, D.C. — James H. Burrows has become the director of the Institute of Computer Sciences and Technology (ICST), part of the Commerce Department's National Bureau of Standards (NBS).

Burrows, who took over last month, was the U.S. Air Force's top civilian official responsible for overseeing its DP support program.

Standards and Research

As ICST director, Burrows heads the program to develop governmentwide computer standards, to advise federal agencies on the effective use of computers and to conduct computer science research, the Commerce Department said.

Referring to the Institute as the standards maker for the government's extensive operations, Burrows said he will concentrate on "maintaining and extending the bureau's reputation in the field of computer science and technology."

The former Mitre Corp. and Lincoln Laboratory executive has served on the President's Reorganization Project for Federal Data Processing. He holds a B.S. degree from MIT and an M.S. degree from the University of Chicago.

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One Developer an MIT Student

Model Based on Baby's Cries Helps Diagnose Ills

By Tim Scannell
CW Staff

CAMBRIDGE, Mass. — Researchers here at MIT have developed a computer-based model of newborn infant cries that is verifying what mothers, pediatric nurses and some scientists have known all along — that simple cries may provide clues to a baby's general health.

Constructed from the recordings of the cries of 55 healthy three-day-old babies, the still experimental model could help pinpoint elusive physical or mental abnormalities when compared with other neonatal soundings, according to Howard L. Golub, a medical engineering student at the university and chief developer of the system.

"Hopefully, in the end, any layperson would be able to do [an analysis] because all you would have to do is tape record a cry on magnetic tape and play it in" to the computer-stored model, he stated.

Eighty-Eight Parameters

Golub collected the cries from infants at the Boston Hospital for Women as they were pricked in the heel as part of a routine blood test for phenylketonuria. The recorded cries were then analyzed and separated into 88 different acoustic components, or parameters ranging from pitch and intensity to resonance and dynamics.

In addition to using the categorized cries to assemble his model for an apparently normal three-day-old child, Golub also drew upon existing knowledge of adult acoustics and speech production. In fact, the newborn model is based upon an adult model formulated by Prof. Kenneth N. Stevens of MIT's Research Laboratory of Electronics' Speech Communications Group, who aided Golub in his studies.

"The thing that I personally did was adapt a theory that already existed to infants by [examining] a certain number of muscle control hypotheses for [adult speech] production" and gearing them for the child physiology. Golub explained.

Because of the many variables involved and the time that could conceivably be spent comparing each cry component with those of the model, Golub transfered all of his infant data to the speech laboratory's time-shared Digital Equipment Corp. Decsystem-20 processor.

He also utilized the school's PDP-9 minicomputer — an 18-bit machine that is similar to the first computers built by DEC and a predecessor of the current PDP line — to analyze each recorded vocalization and break them down into their acoustic parameters. This simplifies the matching of each speech portion with the parameters in the model.

Final results and telltale graphs are printed out on a Tektronix, Inc. plotter linked to the minicomputer.

Reliability a Problem

A complete infant analysis could be performed in about 20 minutes — and possibly only two minutes when his process is further automated, Golub said. However, there are a few difficulties to be worked out before the system can be deemed reliable.

In testing the model with recordings taken from 43 babies with known or suspected abnormalities, Golub identified only 19 of 21 infants who suffered jaundice and nine out of 10 who had a respiratory ailment. The model not only missed some abnormal babies, but also mistakenly diagnosed babies who were well as having abnormalities.

"We have a long way to go," Golub said, referring to the accuracy of the system. Any baby tested against the model will have to be observed for at least two or three years to see if any detected illnesses turn out to be something else or if any undetected ones become evident.

However, "what we do know now for the small amount of data we have is that [the model] is very consistent, and I'm personally optimistic," Golub commented.

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HEW Slammed for Time Wasted Developing Personnel Data Base

By Connie Winkler
CW Staff

WASHINGTON — Five years is an unnecessarily lengthy amount of time to take to develop a payroll/-personnel data base that does not incorporate adequate edits and checks, according to the Government Accounting Office (GAO).

The GAO is once again urging the Department of Health, Education and Welfare (HEW) to improve the computer payroll system through which 160,000 HEW employees are paid $2.9 billion annually.

"We believe that five years is an excessive amount of time to revise the system and bring it into operation," the latest study stated. "Moreover, HEW is still experiencing problems with the revised system, thus preventing it from operating at its full potential."

The report is entitled "Improvements the Department of Health, Education and Welfare Has Made in Its Payroll System."

The GAO recommended that HEW use a computer data base operating system in 1972, but it was 1977 before HEW was using the system. The last GAO review was also in 1977.

HEW's operating system is made up of a common data base for personnel and payroll functions and a terminal network for data collection. Instead of mailing paychecks from a central location, HEW transmits the information to one of 70 offices, where the checks are printed and distributed by hand.

List of Recommendations

The GAO made the following additional recommendations:

- That system editing be upgraded to identify and reject invalid data, or at least flag invalid data for review.

Current editing weaknesses allow small errors in overtime pay rates to enter the common data base files for several thousand employees.

- That the pay system include controls to prevent duplicate payments under different pay records. These controls should detect improper payments before they were made.

At present, there are no controls to prevent consultants or experts from being paid four different times for the same 20 hours of work within a two-week period, the GAO found.

- That bypass features be restricted. One code word allows data to be entered into the system via the terminal network, bypassing all the built-in edits. "Although HEW officials maintain that adequate administrative and mechanical controls govern the use of this code, we have serious reservations about the system operating with this feature," the GAO said.

The bypass feature could enable a dishonest employee to start collecting extra checks. It could also facilitate the entry of carelessly prepared, incomplete or erroneous data.

- That revisions of the combined payroll/personnel data system be closely monitored.

"Had HEW management closely monitored implementation of the common data base, it could have quickly resolved the communication and coordination problems that delayed implementation of the system."

- That HEW officials provide for internal audit coverage.

Infotech Report Out

PENNSAUKEN, N.J. — "Man/Computer Communication," the fifth of Infotech International's Computer State of the Art reports, is now available from Auerbach Publishers, Inc.

The two-volume report examines the commonplace nature of computing bringing more and more untrained people into direct contact with DP.

Contributors to the report pursued such subjects as the personal computer in the office of tomorrow; natural language; using speech to communicate with machines; coping with the 'casual user'; and the psychology of the man/machine interface, Auerbach said.

The report is available for $295 or as part of the eight-report series costing $1,695 from Auerbach Publishers, 6560 N. Park Drive, Pennsauken, N.J. 08109.

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Analyst's Meat May Be User's Poison: Panel

By Marcy Rosenberg
CW Staff

NEW YORK — Business models designed to support a process rather than solve a problem prove most effective for the non-DP user.

Too often, however, a "tremendous" incompatibility exists between the way a job is executed within the user organization and the way a system is set up, cautioned Dr. Peter G.W. Keen, visiting associate professor of the Wharton School of Business at the University of Pennsylvania.

Keen told DPers at a recent conference session here that technically sophisticated design functions deemed beneficial by analysts may not be cost-effective for the user. Or, put another way, "One man's garbage is another man's bread and butter."

For example, to an analyst, a sales forecasting model may provide better output if it includes an optimization routine to allocate media advertising expenses. But a model so designed could spell high costs to the user if it provides information too complex to explain.

According to Keen, "The further away the analysis is from the model, the higher the cost of explanation."

Potential Costs

Other potential costs to the user when implementing interactive support systems include the fixed cost of adjusting to the system, the variable cost of adapting procedures and problems to fit into the model and specification costs.

Users face high costs of specification when they are asked to provide complex information in order to use the system, Keen said. Specification costs would be low if the system required users to make sales estimates.

However, these costs rise when the model calls for inputs in the form of quartiles or trade-offs between two alternatives, he added.

"Managers are extremely intolerant of information that is difficult to assimilate," Keen observed, adding that models for the non-DP user should express common routines in the language of the user to eliminate some of these costs, or at least reduce the need to spend an hour reading the user manual.

Importance of Language

Agreeing that the type of programming language used is an important gating factor in user selection of financial planning systems was copanelist John Lewis, president of Real Decisions Corp., an information processing services consulting firm in Stamford, Conn.

Lewis favors English-like languages over traditional programming approaches such as Fortran, Cobol or Basic which foster user dependency on programmer expertise.

Unfortunately, many models advertised as interpretive, self-documenting English language systems may actually lack certain support capabilities for the user, he warned.

The need for such capabilities depends on the user's application. But some characteristics that should be built in as automatic capabilities to reduce the amount of coding required and render a system flexible and easy to use include:

- "What if" analysis, to allow the user to show the effect of, say, a changing number of units sold over a range of variables such as revenue and gross or net profit.
- Goal seeking to, for example, help a user determine how many units must be sold to become profitable in a given year.
- Display capabilities as automatic, one-line commands.
- Financial and statistical functions to handle simultaneous equations or to perform risk analysis.

In addition, Lewis recommended a financial planning model that can be easily converted from use on one system to another in as few lines of code as possible.

System builders must bear in mind that what is good for the analyst may not fulfill the needs of the non-DP user. As if to underscore this point, Lewis drew an analogy: "In 1978, four million people bought quarter-inch drill bits — not because they wanted quarter-inch drill bits, but because they wanted quarter-inch holes."

Network Set for Completion This Year

GAO Finds a Few Problems in FMHA System

By Connie Winkler
CW Staff

WASHINGTON, D.C. — The Farmers Home Administration (FMHA) is in the process of developing a Unified Management Information System (Umis) that will include a terminal network to each state FMHA office, but the General Accounting Office (GAO) has looked at Umis and says the FMHA isn't doing it right.

The GAO recommendations, issued earlier this year, read like a primer for any computer operation developing a management information system.

FMHA provides financial assistance at reasonable rates and terms to rural Americans who are unable to obtain credit from other sources. As of October 1977, FMHA was servicing one million individual borrowers and 13,300 associations for an indebtedness of $22.5 billion.

FMHA provides its services through 1,750 county offices, 42 state offices and a national finance office in St. Louis, where the computer center is located.

Umis is to manage all this loan information, providing the capability of retrieving information via terminal. Development of the system began in 1975 and is scheduled to be completed this year.

Indeed, FMHA has made some mistakes. For $57,428, it bought 20 terminals with 64-character lines for an Illinois pilot project even though Umis required 80-character lines. The 64-character line was compatible with the requirements of a related agency, the Agriculture Service Center.

Although FMHA thought the terminals could be reprogrammed, this was not possible and they were re-leased to other agencies.

And FMHA early on conducted an information requirements survey of user needs. The surveys were not summarized or evaluated until after the Umis development contract was awarded to a private contractor, Systems Development Corp. (SDC).

GAO Suggestions

So that FMHA's development of a management information system will not retrogress, the GAO recommended that the FMHA:

- Establish a steering committee representing users, system designers and top management to provide the planning, direction and control over Umis development.

Currently all major decisions on Umis are made by the FMHA administrator. The steering committee would be responsible for decisions on project continuation, cost/-benefit analyses, budgets and life cycle costs and for studying the impact of organization changes and approving design modifications.

- Intensify efforts to install a computerized project control mechanism to monitor the progress of Umis development, identify and analyze schedule and cost variances and better plan the use of FMHA resources.
- Establish a budget for Umis to cover both development and operation phases, noting Umis as a separate line item in FMHA's budget justification.
- Install a cost accounting system to account for all costs incurred during the system design, development and operational life cycle. Total life cycle cost estimates should be updated on a regular basis, the GAO said.
- Redefine agency/user needs in specific and quantifiable terms to provide performance criteria for evaluating Umis alternatives.
- Run the Illinois test for one year instead of six months to allow time to get the bugs out and adequately evaluate the system.
- Defer expanding the system until the Illinois results are in and evaluated.

The GAO study is appropriately titled "Farmers Home Administration Needs to Better Plan, Direct, Develop and Control its Computer-Based Unified Management Information System."

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Networks Seen Saving Dollars for Universities

By Marcia Blumenthal
CW Staff

NEW YORK — Institutions of higher education could save programming dollars through a network that would allow them to share application and data base software.

The roadblocks to establishing such a network are not technological but organizational, economic and political, according to a study completed recently by Educom, a nonprofit consortium of approximately 300 institutions dedicated to developing efficient ways of using computer services.

Users who could benefit from networking are constrained by the way their universities allocate funds for computing services, according to Beverly O'Neal, a program manager for Educom who co-directed the research on network affiliation.

If users have "free" access to computer service within the university, there are no incentives or funds to seek computer services outside. In instances where universities allocate a specified amount of funds to departments to cover their DP needs, users have the flexibility to purchase services on the outside, O'Neal indicated at a recent conference here.

O'Neal's research team discerned a growing trend toward the allocation of "real money" to users within the university environment.

Users may also obtain funding for their DP requirements through grants from government or industry. While this money gives users the flexibility to purchase services in a variety of ways, the sources of these funds are often unpredictable.

Therefore, depending on the funding options available within institutions, users may purchase computing services locally only or may obtain them in several different ways — either locally, externally or through the purchase of their own hardware.

Fostering Affiliation

In order to foster an environment favorable to network affiliation, the institution of higher education must recognize that the computer center is not merely a provider of computer capacity, but also a provider of services, O'Neal said.

In all probability, networking will not replace the local data center. Instead, it will be a valuable resource for obtaining specialized applications or data bases for which there is a minimal demand internally, O'Neal concluded.

The trend toward allocating hard funds to users will allow them to take advantage of a wider range of DP options.

In any case, the cost of the network must be sustained by users, noted Ronald Segal, co-researcher on the Educom project. While this is a fundamental requirement in the commercial sector, it is novel in educational settings, he pointed out.

Considering Demand

In assessing the feasibility of participating in a networking arrangement, a university must consider the impact of demand for services on its cash flow, according to Norman R. Nielsen, program manager of computer systems for SRI International.

A rapid influx of cash spurred by demand for a popular program may result in a deterioration in response time for these services. Or a reduction in cash flow resulting from a low demand situation would result in operating losses for data centers.

These losses would have to be subsidized by other institutional funds.

Often institutions, for reasons of control, local service or prestige, target a minimal DP capability for their central computing facilities. In a free market situation, data centers with minimally attractive offerings would see their users seeking outside services.

This naturally would bring up questions on the feasibility of maintaining the data center at its present level, which would be contrary to university's organizational objectives, Nielsen noted.

Similarly, competitive pressure to offer a service at an attractive price may force some institutions to specialize their services. This may be not be in keeping with a university's overall objective of providing users with a wide range of services, Nielsen suggested.

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Manner of Acquisition Important

Expert Outlines Software Taxation Policies

By Marguerite Zientara
CW Staff

NEW YORK — Federal tax treatment of software costs depend on whether that software is self-developed, bought or leased, John Haner, a partner with the accounting firm of Arthur Andersen & Co., said at a conference here recently. If the software is self-developed, it can be claimed as a current expense and may be deducted in full or amortized over five years, he said.

If software is purchased without hardware, it must be amortized over five years, and no investment tax credit (ITC) is available to the purchaser. If software is bought with the hardware, however, it undergoes accelerated depreciation and the ITC is available, subject to various conditions, Haner explained.

Problem of Definition

One problem with software taxation is the lack of a uniform definition of software, Haner noted. A reasonable definition that is not, however, embraced throughout the country states that software consists of all the programs and routines needed to do a desired task or set of tasks or to maintain the programs being run, excluding external instructions or control procedures.

Also fuzzy is the distinction between self-developed or purchased software, Haner noted. A taxpayer who needs design work on his software will be assessed on the basis of the extent and nature of the help. It would be important, for example, to determine whether any original work had been done or modifications only had been made, Haner explained.

From the vendor's point of view, the problems are similar to those of the buyer/lessee, according to Gordon Pehrson, a partner in the Washington, D.C., law firm of Sutherland, Asbill & Brennan.

Current questions include how to treat software development costs, whether it is to one's advantage to sell or lease a product and whether someone who develops a software package should sell it to a software company or try to market it himself.

While the answers to the issues are "not always clear," Pehrson noted, there is an advantage to claiming software development costs as an expense instead of amortizing those costs over time — greater cash flow.

IRS Sale Conditions

On the other hand, there is always the possibility that the Internal Revenue Service (IRS) will recast the transaction, calling it a sale and not a lease, he said. In that case, the rental payments would be considered payments on the sale price, and the entire sale price might be taxable in the year of the "sale."

Pehrson outlined the IRS's conditions for a "sale" as follows:

- The lessee will get the title upon full payment.
- The total amount of money the lessee pays is an "unduly large part of the total" cost.
- Payments exceed the fair value amount.
- There is a purchase option for a nominal fee following the rental agreement.
- The lease runs for the entire period of the asset's usefulness or life.

When the transaction is motivated by business realities, such as protection of the proprietary right to the software, however, the transaction is considered a lease and not a sale, Pehrson said.

New York State Tax Commissioner Thomas Lynch concluded with the story of the New York State Legislature's "miscarriage" of justice in 1965 involving the implementation of a software sales and use tax.

While at that time the issue did not raise the question whether software was "tangible, personal property" and therefore taxable, Lynch said, by 1970 it was decided that the sale of a software program was subject to tax, as software was a tangible object.

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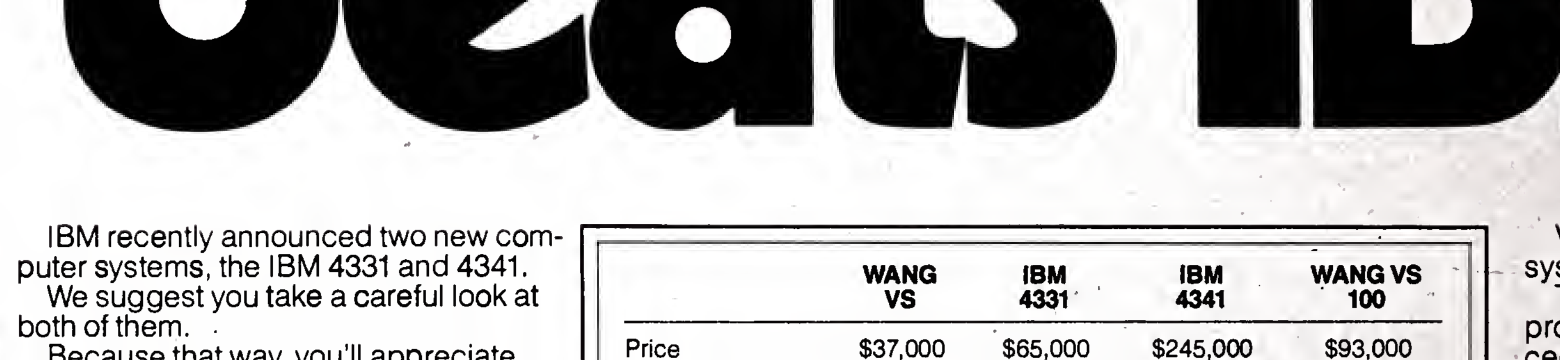

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DP92/CW7169

A Cookbook Approach To Structured Methodology
or
With Five You Get Top Down Coupling

By Gopal Kapur

IN DEPTH

To teach a seminar (or to give a management presentation) on structured analysis, structured design or structured *anything* , always start with a data flow diagram or Nassi-Schniederman diagram or a bubble chart or Warnier diagram or a hierarchical chart — never a flowchart (too passe).

Fill the circles or blocks with Greek letters. With tough audiences, Sanskrit and Phoenician symbols have had a more desirable (intimidating) effect.

Next, add primes and bars to any English letters you might have used. Use Roman numerals, preferably starting with a number close to XXIV, since most people can only figure up to XIV. Thus, more intimidation. MCMLXVI devastates even the best.

Next, use an obscure (and by all means, don't explain) convention of shading and striping involving at least three colors and refer to your convention as the "international convention" of representing data flow, automation, transform and transaction analysis. (Now is a good time to go into detailed discussion of *I'm OK, You're OK, The Grass Is Always Greener Over the Septic Tank; The Hite Report* and *The Kamasutra.*)

While drawing the diagram, make remarks such as, "Any analyst should know these conventions, since even seventh graders are familiar with them." This will complete your "top-down intimidation" of the audience. Now, you are ready to begin your lecture!

"Structured analysis and transform analysis are not strategies of design, but are simply ways to switch gears to think of continuous levels of abstractions which will allow us to identify the afferent and efferent to the central conversion module, keeping in mind the parallelism of datum.

"However, transform analysis only helps you in the input and output legs of the mudular afferent/efferent analysis. Nonetheless, it helps you dissect diametrically opposed pieces of the central transform into structure charts which will then give you insight into the pathological data connections and neurological control structures existing between various levels of abstraction.

Dedicated to oral flashers of structured methodology, with apologies to Edwin Newman.

"By repeating this process concurrently, you will be able to see the light at the end of the tunnel. The inner transform center must be small enough to conduct transaction analysis but not too big to exceed your "hrair" limit.

"You will now be ready to start with initial stages of final structure analysis, which of course is repetitive iteration of transaction analysis tampered with transform analysis. This initial stage of structure analysis will produce a central transform whose peripheral cohesion may "stink" a bit, but its coupling should be fairly acceptable.

"At this time, be careful of the tremendous amount of fanout from the central transform center as this type of fanout will certainly lead to noncohesive cohesion and a highly coupled intermodule structure with commonality of subschemas. The natural inclination of data is to lean to the left, but as the afferent is to the right, the conflict may lead to a sagging morphology (film at 11)."

If anyone asks a question at this time or wants some clarification of the methodology, a good answer is: "This is really not a strategy, but more of an observation. Nonetheless, it is supported by a large number of proponents of structured methodology." (Drop some names here: Dijkstra, Parnes, Knuth, Saheeb, Prof. Corey, Mills, and so on. A good followup comment is, "This falls out so naturally that it should be completely obvious to you.")

Now continue: "Neither transform analysis, transaction analysis, bubble charts nor structure charts work everywhere. But as you all know, the knowledgeable practitioners have observed that portions of these work everywhere."

Notice the use of the work "observed" in the last sentence. Never say "written." Such definitive statements will get you in trouble. Participants will ask for references, thus creating an uncomfortable situation for you. Who needs it? The use of the word "observed" implies that you have certain inside knowledge of what these people are saying. In fact, it is a good idea to imply to the audience that you talk to these people often.

"So transform and transaction analysis can help you get started with an initial structure chart (level 0 minus 1; and counting) and fan-in inversion investigation providing that you have properly understood and defined the afferent and efferent of the outer transform analysis of the inner transaction centers. Now that we have a fairly well developed structure chart, the next step is to start decomposing the highly cohesive levels of abstractions in order to define the parallelism of data.

"Next, syntactical analysis is very critical if the fan-in (Sally Rand, where are you?) analysis indicates that the scope of effect and scope of control conflict with the overall morphology of the heuristical algorithm of the left-leaning modular afferent. Now that the preliminary morphology of the intermediate structure chart has been established, you can proceed with extrapolation of data flow in order to arrive at the final structure chart."

Class Participation

This is a good point in time to ask the class to develop a data flow diagram using the bubble chart method. Warn the students to keep in mind the transform analysis, transaction analysis, scope of effect and control, afferent and efferent and the sagging morphology that may result, if they are not careful about the pathological data

(Continued on Page 34)

(Continued from Page 33)

parallelism. Wait a few minutes and collect class solutions.

Now display your *partial* solution to the problem. Tell the class that this is not the ultimate solution, because there is no ultimate solution. Don't criticize any particular solution (developed by the participants) as being totally bad, neither accept any individual solution as the best approach.

It is a safe policy to partially accept and partially reject each solution (this way no one is completely offended, yet they will look forward to the ultimate solution from you, which of course you will never give).

Tell the class that if you were to take the good parts of the various class solutions and put them together in a well structured puzzle, you would have something very close to the "correct solution." (Good time to play Instant Insanity, Master Mind and the Moroccan Ring games. Practically no one will be successful, thus more intimidation.)

Be sure to warn the class about the bad side effects whenever there is a tendency to mix cohesion with coupling and that the top-down approach may lead to excessive front-out of modules which have poor afferent in the input modules. If improved coupling does not result, increase the nodules on your gismo (inside a plain brown wrapper, of course).

If questioned, a good remark would be, "This, of course, is not the final solution, as I still have to do further refinement by applying the transform and transaction analysis, keeping in mind the reasonable approach of cookbook methodology of structured analysis and design."

Now, make the following observation (don't forget, it is an observation and not a definitive statement): "Context editing and content analysis have the parallelism of poor cohesion and not-so-acceptable coupling, while afferent and efferent of the output leg have better coupling and not-so-acceptable cohesion. Therefore, I will at this point in time, establish a new level of abstraction while pushing the structure stack downwards a level (point to a *large* portion of your sample solution) and establishing a higher level of abstraction, thereby facilitating the process of stepping from transaction analysis to transform analysis.

"This process will lead to a data flow diagram with a desirable morphology while still not violating the heuristics of the algorithm. Now, what we have here replaces the two editing contexts into a single more heuristically valid cross-edit which will make the user understand the pathological controls leading to excessive fan-out of the pushed-in central module."

If asked a question, repeat the question while modifying it a bit and remark, "I will be happy to go back and explain the morphology of structures using Bohm and Jacopini coding constructs keeping in view what Dijkstra has really promised to write about in his new text (this implies that Dijkstra privately consults with you), provided that you have a clear understanding of Myers methodology of composite design."

Time for Harangue

At this time, go into an impassioned harangue condemning COBOL as unfit for structured programming. Talk about the days when you wrote ALGOL and played with SNOBOL and how you long for the opportunity to do so again; this will intimidate all those who use COBOL and will keep them from questioning your abilities.

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                                  ----------   ----------   ----------
                                  $1,929,861   $1,703,506   $1,404,229
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                                                      1978        1977        1976        1975        1974
Income:
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     Other income, net                              10,873      16,810      20,787      13,005      12,956
                                                ----------  ----------  ----------  ----------  ----------
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tently while tapping your fingers on the desk or twirling your pencil, snickering occasionally while looking around impatiently. A well-tried answer is: "Now then, there is nothing cookbook about the methodology, but what we really need here is a clearer understanding and application of data flow diagrams, structure charts, program morphology, pathological data connections, neurological control constructs, module afferent and efferent and heuristics of the module functions."

Then continue with, "If you would like, I would be glad to start over again" and further remark that "any good programmer should have understood the simple concepts long ago." This will take care of even the most persistent student.

Where were we? Oh yes, stacks of algorithmic fan-outs. The next important step is to investigate the Hipo methodology. Since we all know that Hipo was IBM's invention, it is very easy to take potshots at the entire methodology. It is an easy way to get laughs, and no effort should be spared at this time to make jokes at IBM's expense.

You will notice that the class is quite grim by now, so go to it. A good leading question to ask is, "Do you know what Hipo really stands for?" Some of the participants will venture the usual explanation, Hierarchical Input Process Output."

Produce a smug smile and shake your head. Then say, "It really means How IBM Puts you On." Laughter, another triumph for you.

If the audience responds well to your last remark, quickly go into the controversy of Chapin charts vs. Nassi-Schniederman charts. Give references to the Association for Computing Machinery SigPlan Notices, August 1973, then refer to Chapin's paper on Chapin charts and immediately read from letters to the editor (ACM publications) chiding Chapin for renaming the charts. This will get you snickers from the class, and you will have impressed at least a few people by your razor-sharp wit.

Back to Hipo. Make remarks like "Nobody I know has been happy with the methodology." Make certain that you don't identify anyone. The all-encompassing word 'they' works the best.

Give references of certain companies and groups at least 1,000 miles away from the site of the current class. Examples of foreign countries, especially European, are very impressive. (Examples of countries and places such as Namibia, Hicksville, Nagaland, Fresno, Kaithal and Uganda have not had the desirable effect, hence, should be avoided.)

Getting More Abstract

Now you need to deal with more abstract design, keeping in view more abstract data definitions. This will lead your class to analysis of cogitation of cohesive data with a view to partition transactionally transformed data into a top-down inverse matrix of sequential subschemas.

These transactionally transformed sequential subschemas can then be appended to the afferential control structures containing subschemas, thereby giving us a very clear understanding of the hierarchical control structures, linear data flow, tangential control coupling, along with substacks of data transform modules.

You must, however, point out that a change that happens to fall into the lower levels of abstractions of the top-down structures will lead to a structure with severe pathological morphology containing excessive fan-outs and progressive regression.

This type of progressive regression, combined with a total lack of control flags being passed at higher level modules, keeps the intermediate stubs at a recursive level of transform flux (try Kaopectate), thus damaging the intermodule coupling as well as affecting the fan-in of the pathologically sound inner transform centers, which of course, is a very undesirable approach to solving programming problems.

However, this is not per se a design consideration but has a profound influence in some cases related to overall systems design and program development.

A possible question from one of the participants might be (some people never give up): "Does this methodology apply specifically to day-to-day

(Continued on Page 38)

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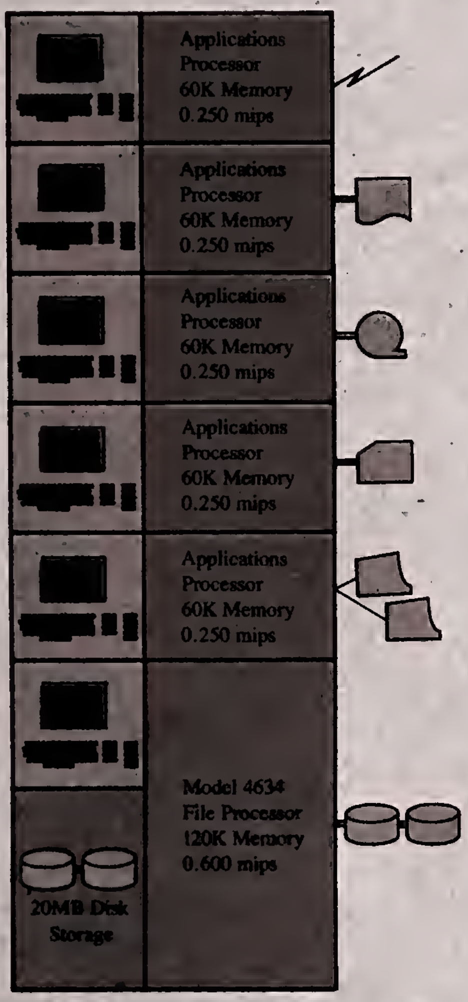
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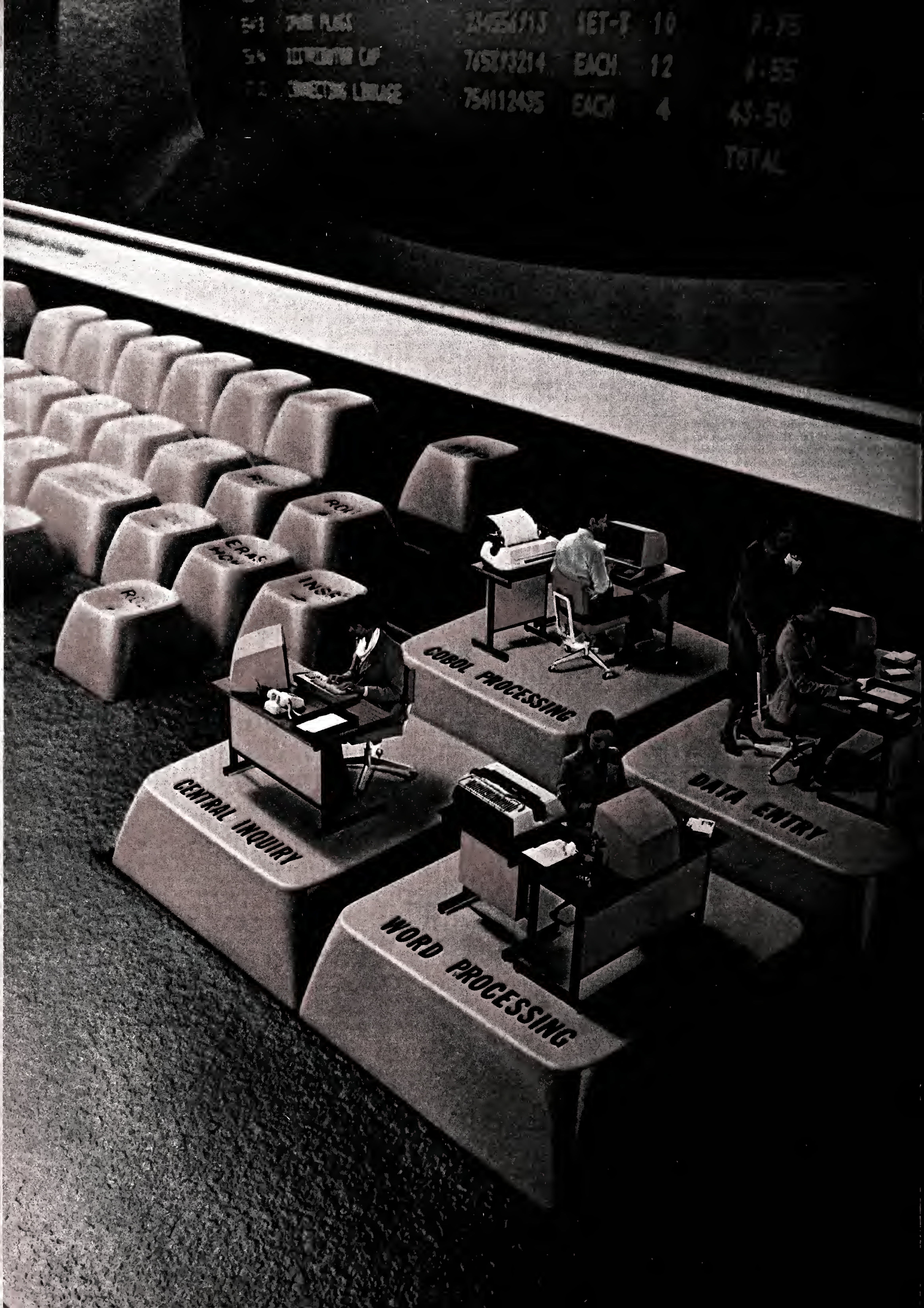
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(Continued from Page 35)

program design? After all, that is what my responsibility is."

Your answer at this time should be: "Let me not answer this question at this point in time and in fact let us not even talk about programs and systems but let me talk about the whole thing. Because it applies to individual stubs, it is a clear game, or should be, that many of the stubs are trivial logic drivers.

"However, from the projects we were involved in, in Afghanistan and Bhutan, we learned that our first step should be to build the most important stubs by taking appropriate strips from each stub while avoiding the uglier transient modules. The selected outer strips should be combined with not-yet-coded subordinates which may at times pervert the data flow graphs of the outer strips, thereby voiding the upper levels of logic drivers which should have been pushed down the shelf during the first level of structured walk-through."

Then ask if there are any more questions. No one will dare — you're safe.

Family Stubs

"The next important subject deals with performance criteria in relation to data flow volumes. In order to develop a basically reliable performance criteria, we need to focus our attention on the parent and child stubs (also known as the family stubs — LTAs don't count). Child stubs are easier to write than the driver (or parent) stubs, which of course doesn't hold true every time, thereby requiring us to further investigate the pairwise integration of interfaces between the subtrees.

"Unfortunatey, this pairwise intergration investigation involving inverted indices invariably inverses the initial performance budgets inaeternum indicating insufficient initial performance budgets inaeternum indicating insufficient interactions in between individual interfaces. Hence, it should be avoided.

"Therefore, one needs to be extremely careful that the lower level stubs are not comsuming most of the allocated performance and time budgets. If this is allowed to happen, the parent stubs will require much more phased oriented integration time, thus adversely affecting the initial performance criteria.

"The next step in structured analysis is to develop a high-level strip with properly visible arrows (depicting afferential data flows). This can be easily accomplished when the lower level of strip arrows is fanned out into appropriate second and middle level transform structures with properly fanned out structure strips.

"This iterative phased striping and restriping of successive top-down structures will lead to a well-balanced top-down-oriented chart which should have a preagreed-upon morphology of log n-1 fanouts and incurvate upward mobility of central data and transformed subschemas.

"Now that a fairly well balanced structure has been developed, we are ready to go into our second phased walk-through (or walk-on) to properly ascertain the man-machine interfaces."

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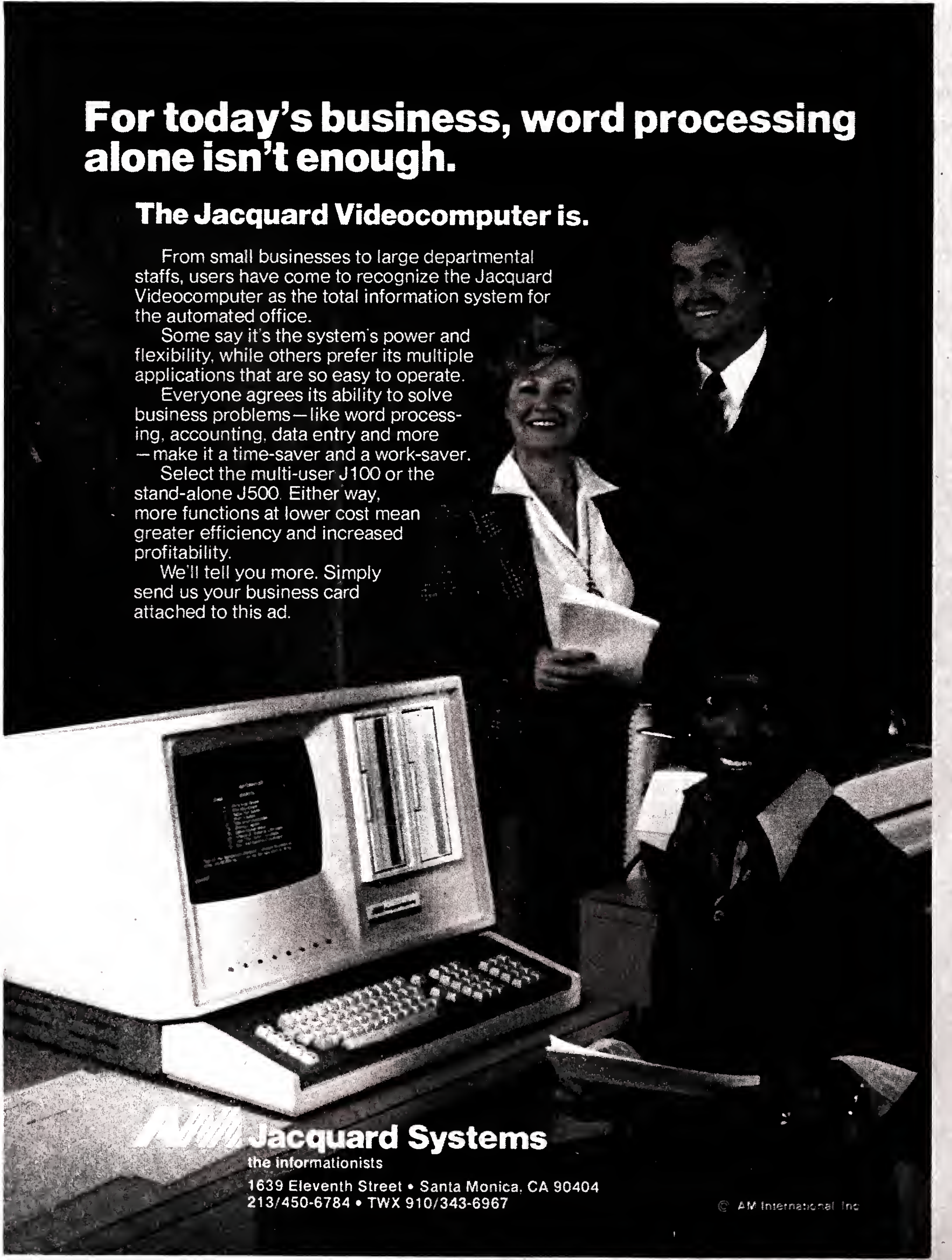

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day of the class, make remarks like "You know, usually we have several workshops during this seminar, but unfortunately we don't have the time because the class has been progressing rather slowly." This remark will generate guilt among the participants and you can make your point by addressing those who have had the affrontery and effrontery to interrupt the class with confusing questions.

Now continue: "The design process is not over. In fact, even structured analysis is not over yet. What we need to do next is define data requirements and do data flow analysis. However, as I mentioned on the first day, the subject of data flow analysis is beyond the scope of this seminar and as such will not be discussed (now is a good time to announce your next seminar on data flow analysis).

"The last, but certainly not the least, step in structured analysis deals with the subject of program flags. It has been our experience that improperly cohesive data and control flags create partially coupled hybrid flags (these are the flags that can't have little flags of their own) which, in the absence of default parameters, may need to be debriefed. Default parameters should be avoided as they tend to travel at turtle-like speeds, thereby making the process of debriefing very frustrating but nonetheless rewarding. Now, the analysis phase is completed."

By following these clear guidelines, you will follow in the tradition of those great instructors who through their clear thinking and lucid writing have helped make DP what it is today.

Kapur is president of Kapur & Associates, Inc. and consults, teaches and writes in the fields of information systems management, project management and programmer productivity.

His firm serves clients in the U.S., Canada, Europe, South America and Asia, specializing in the application of innovative methods to help solve DP problems.

Kapur graduated summa cum laude *from Thapar Institute of Engineering (India) and is listed in* Who's Who in the West.

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EDITORIAL

Surprising Results

The results of this year's Administrative Management Society salary survey showing that programmer and analyst salaries rose by between 5% and 6% from last year [CW, July 9] are somewhat surprising.

Those pay increases do not even keep pace with inflation, which ran about 7% last year. Assuming that the figures are accurate — and there is no reason to think otherwise — programmers, programmer/analysts and systems analysts actually lost ground in terms of real salary.

This is a particularly puzzling phenomenon because it comes at a time when demand for programmers and analysts seems to be at an all-time high with companies actively bidding for an apparently limited pool of talented people.

Is there a rational explanation for the decrease? Your thoughts on this are welcome.

Managers, Take Note

DP managers should be alert to a new generation of powerful utility software that, by eliminating the need for large programming staffs, could lead to reorganization of many DP departments.

The recently released Automath utility is one example of such software. This package from Odyssey Systems, Inc. of Watertown, Mass., is reportedly able to virtually remove the need for Fortran programmers at large, scientifically oriented IBM sites [CW, July 9]. Automath can swiftly solve complicated algebraic and differential equations in a mode transparent to the user, according to Odyssey.

Moreover, the package is said to generate a fairly elegant Fortran program to accomplish the same numbercrunching it performs transparently.

Automath may signal a coming trend. More software of this type would certainly change the field of options available to DP management and, in these inflationary times, could raise computing to new heights of cost-effectiveness as a means of enhancing productivity.

DP managers owe it to their employers and themselves to stay abreast of such software developments. And programmers should constantly work to expand their repertoire of skills, since demand for their *current* skills may be more tenuous than they think.

Management can help here as well by giving programmers opportunities to make this expansion. A time of rapid change in the state of the art warrants major corporate investments in internal training and employee development projects. Such investments stand to benefit all concerned.

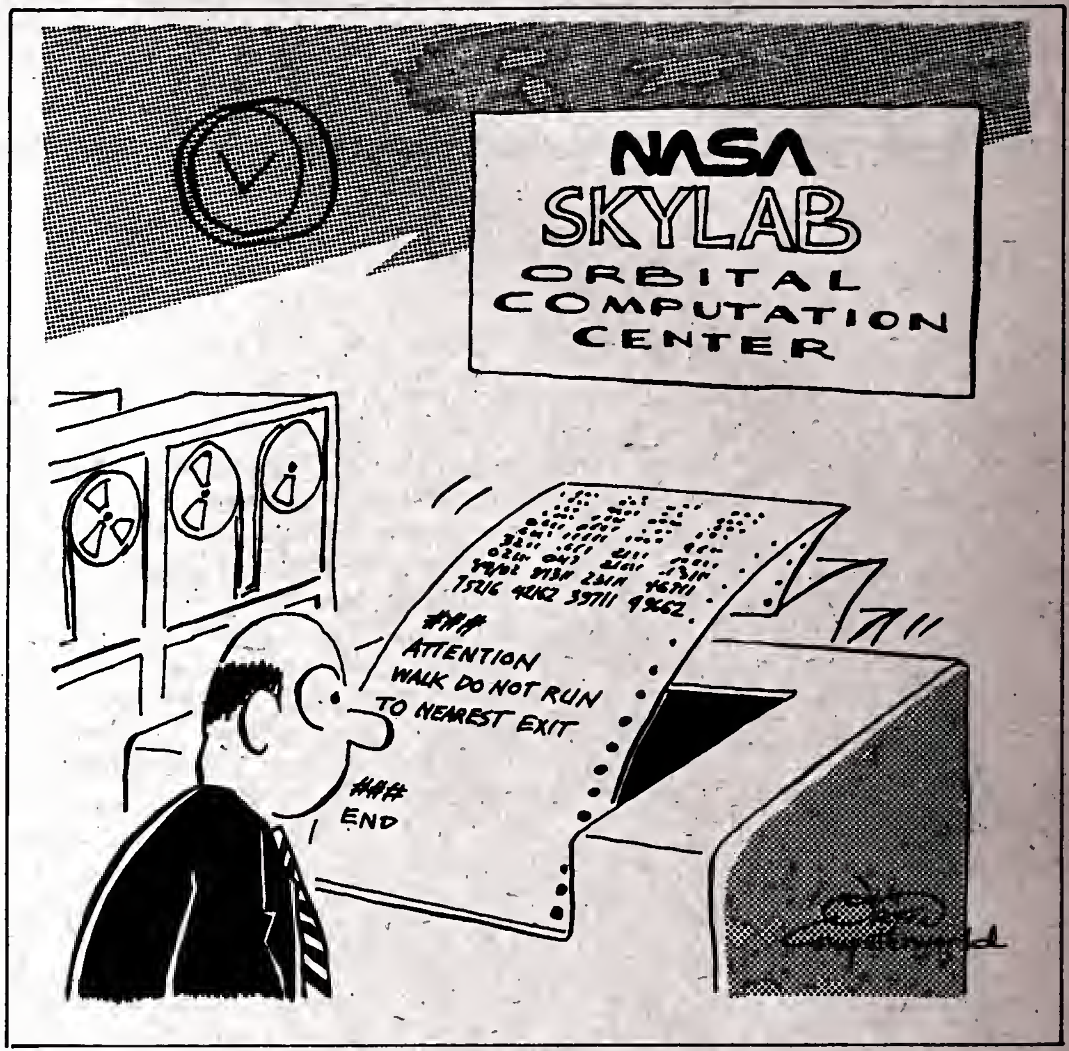
DATA PAST

Five Years Ago
July 17, 1974

WASHINGTON, D.C. — "Tough" privacy legislation covering federal agencies and the filing of "privacy impact statements" were two of the more dramatic proposals to come out of the meeting of the Domestic Council Committee on the Right of Privacy headed by Vice-President Gerald Ford. In all, the council, which was made up of high-level personnel from 10 government agencies, approved 14 staff-prepared initiatives at its first full meeting on proposals since being established by ex-President Richard M. Nixon on Feb. 23, 1974.

Eight Years Ago
July 21, 1971

PHOENIX — An IBM customer who settled his unbundling suit out of court said he received "many, many times what I ever hoped to receive if we [had been] successful in the class action." The award was "confidential," according to Everett Warner, president of Motor Replacement Corp., but informed sources placed the settlement at between $15,000 and $30,000. Warner said he dropped the class allegations in the $5 billion lawsuit so he would not "preclude anybody else from instituting their own class actions."



LETTERS

No NCIC Switching Plan

Contrary to the June 11 editorial headline, the Federal Bureau of Investigation has no current proposal to implement message switching in conjunction with the National Crime Information Center (NCIC) system. This is an important fact, since the editorial was predicated on the existence of such a proposal.

The proposal for new NCIC equipment requests a front-end communications control device to increase availability of the system to the users. The NCIC system was designed to operate continuously for the benefit of law enforcement throughout the country.

Current levels of NCIC availability result in unnecessary, serious risks to law enforcement officers nationwide who depend frequently on the NCIC system in the line of duty.

As acknowledged in the editorial, NCIC DP equipment is obsolete and overloaded. Consequently, hardware reliability and performance lapses lead to situations where state and local law enforcement officers must confront dangerous criminals without having the benefit of precautionary and investigative information which the NCIC system was designed to provide rapidly and reliably.

The equipment requested under this proposal is neither planned for nor capable of message switching among states and the FBI. This equipment will perform several functions, none of which involves message switching:

- Act as communications interface between user lines and the NCIC host (IBM 360/65).
- Perform polling, line control.
- Provide prompt notification to users when host fails.
- Execute operations which will reduce system recovery time when host failures occur.

The proposal document has been provided to and reviewed by appropriate congressional members, committee staffs, consultants, the Office of Technology Assessment and Executive Department agencies.

The issues involved in message switching will most likely be resolved in a constructive, cooperative forum through analysis and reasoned judgment among organizations interested in effective law enforcement.

Judge William H. Webster, director of the FBI, has given explicit assurances to the Congress that none of the requested equipment for NCIC will be used for message switching.

William A. Bayse
Assistant Director
Technical Services Division
Federal Bureau of Investigation
Washington, D.C.

Still Waiting

On Aug. 14, 1978, *Computerworld* carried an advertisement soliciting subscriptions for a new journal called *Programmer/Analyst.* Our names, among others, were listed in that advertisement as authors of articles that were to appear in the first issue.

We would like to clarify our relationship with the journal and with its publisher, Frank E. Alexander. Alexander contacted us separately asking that we each write papers for his new and as then unnamed journal. We agreed.

Our subsequent experiences with Alexander differ in minor details but they are substantially the same. After sending the papers and receiving partial payment for them, neither of us heard from him again.

Like the readers of *Computerworld,* we are also waiting to see the first issue of *Programmer/Analyst.* Like those who have written or called Alexander, we have received no satisfactory response — or no response at all.

We wish to say that apart from this we have no connection with Alexander or with *Programmer/Analyst.*

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Herb Grosch

Lawsuit Could Set Dangerous Precedent

Let me tell you about one of the weirdest court cases in a decade known for litigation and judicial drama. And let me start by saying that the outcome, if not reversed further up the chain, threatens the very idea of standards, of professionalism and of the public interest.

The actors in the drama were not from our trade, and the engineering society involved is one unfamiliar to most of us. But you won't have to read far before your flesh will begin to creep and your concern to mount.

The story begins with boiler standards — yes, regular old steam boiler stuff. In the shadow of Three Mile Island, readers may have forgotten that steam also has its dangers — that boilers blow up, and plants and equipment and even people get hurt.

Many years ago, in fact back in the last century, before the American National Standards Institute (Ansi) was chartered, one of the oldest engineering societies began to work on boiler "codes": safety standards and approved manufacturing and testing methods. This was the American Society of Mechanical Engineers (Asme), now headquartered in mid-Manhattan. One of the specialized areas of concern was water level control, as steam locomotive buffs well know.

Years went by; Ansi (and its predecessors) became dominant in the voluntary standards movement. Asme continued to contribute heavily to boiler operating standards. There was an Asme Boiler and Pressure Vessel Code Subcommittee on Heating Boilers from 1951 onward.

Just as an Association for Computing Machinery (ACM) or Data Processing Management Association (DPMA) standards committee is manned by members who often work for computer manufacturers, so the chairmanship of this Asme subcommittee was held by a vice-president of a company which made float-type water level controls. And he had been vice-chairman, and before that a working committee member, in the years before.

No Asme staff employees were involved — just volunteers, members. It would be so in ACM also, as regards X3 data processing standards groups.

The subcommittee brought out a standard which referred to the characteristics of float-type water level controls. I presume it was also published by Ansi; nevertheless, because it originated in and was promulgated by the subcommittee it was referred to as an Asme standard. There are hundreds of others also credited to Asme, from anchors to screw threads.

Enter a new company, the Hydrolevel Corp. Its founder has invented a probe-type water level control: Pascal instead of Fortran, hmm? The company hopes to sell effectively against

(Continued on Page 44)

HUMAN CONNECTION/Jack Stone

Common Obstacles Deter User Involvement in DP

How to get users cooperating with the data processing organization to produce a decent system: that's a pretty tough nut to crack.

Almost everybody knows the dreary platitudes that apply to this chronic problem: "good relations" are mandatory, "involvement" is key and exquisite "communications" is a foregone conclusion. But, as we are so prone to do with other such headaches, we tend to avoid it. So, in many organizations, the issue remains unresolved or even unapproached.

When I learned that Ben Knowles had addressed this subject at the Data Processing Management Association's Region V Conference this May, I quickly arranged an interview to get his ideas about this very important subject. Ben is vice-president of the Brandon Systems Institute, a DP educational services firm in Bethesda, Md. Gary Slaughter, the firm's president, also contributed his thoughts.

Q: *Why do you think it is so hard for users to get committed to a systems development project?*

Gary: Because users represent a wide assortment of backgrounds and experience levels, it's not possible to give a simple answer.

We do know that many users who have troubles in dealing with the DP people express feelings of insecurity, ignorance, hostility or just plain fear in dealing in the DP environment.

Ben: But over the years we have been able to identify four fairly common obstacles that seem to affect proper relations between DPers and users. We have learned that by seeking ways to overcome these barriers we can discover how to increase user commitment, particularly by defining the kind of involvement that will greatly increase the chances of systems success without requiring that a user design and program his own system.

Q: *Could you briefly describe the first one?*

Gary: Surely. It's the general area of problem definition. Most users understand that they have a need for DP service, but they lack the proper level of understanding of this need. Many users can only define a few significant changes they desire in their operations. Others have not thought through the impact of these changes on related activities. Still others don't know whether they can handle the magnitude of the change they are seeking.

Ben: So, to cover the unknown, many users prepare a long list of system capabilities, with the hope that the DPers will design them into the new system, cheaply and instantly.

The user does not appreciate that the items must be ordered into some reasonable priority, resource allocations

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THE TAYLOR REPORT/Alan Taylor

Better Control of Output Quality Possible

One of the most touching letters I have had recently came from the DP manager of a large publishing house. He was complaining of the all-too-common habit of truncating titles at the end of name-and-address lines on mailing labels.

He had a point. The mailing people were not quite up to date and still thought he was an analyst rather than a manager. His title was placed in a 4-character field at the end of the first line and went through the personalized letters routine, which treated it as his last name. The result: "Dear Mr. Anal."

Is this to be the occupational hazard of the data processing industry? Exactly where does the problem come from? It is no use to point fingers at the program authors. Far too often, such small things go wrong and keep on going wrong. Something is being overlooked in the systems process, but where?

Looking around, I found that it was not only the truncation area that was having such problems. For example, billing runs where almost everything goes right — but every now and then someone gets billed (or dunned) for $0.00 — also suffer from the same basic type of fault. The system design is sufficiently good and the results so valuable that no one wants to go back and try to dig into the system to try to correct for the occasional errors. This is a very reasonable premise, and one we all know well.

In fact, this attitude toward small errors comes out all over the place. A stockbrocker recently told me about the computerized displays in his office and how valuable they were. Referring to one of them, he explained that it indicated the day's volume of transactions. Then, looking at it, he said, "What, only two transactions today? That can't be right. We often have wrong figures coming from the system."

However, he keeps on using it either because it isn't worth bothering about its unreliability or because he can't do anything about it. "Computer error" strikes again.

These errors are rather like the almost equally ubiquitous "keypunch error" or "input error" we used to run into so often. And there lies the clue to their treatment.

Solving Output Error

Nowadays, we rarely hear of the input error being more than an inconvenience. It isn't that everyone is now providing perfect input. Often, on analysis, the input error turned out to be some input situation the systems analyst, looking at the big picture, had overlooked — items like a 53-week year, for instance, or things which did not fit yet into the programmed system.

And things still get overlooked, but now they get caught in the edit routines which are almost universally used in both batch and on-line systems. The input edit routines have no function except to establish a quality control on the input.

So why not do the same on output — also as a matter of routine? It won't cost much and will permit the interception of those "dirty output" cases, without interfering with the smooth running of the main system.

Who Should Do?

The question, as usual, is whose task it will be to insert the output "cleaning" run. (Perhaps that term is better than output edit. We already have output edits that do formatting, editing and so forth.)

Output quality assurance runs are different from those. It is quite likely that the error actually took place in the formatting run. In fact, that is exactly where the first error took place with the "Dear Mr. Anal" case. The formatter inspected the line as if it were all a name.

So don't simply make this "cleaning" an added task of the output edit operations as they now stand. It isn't good enough.

The output quality assurance routine has to be ordered by the systems analyst, the same person who orders the input quality assurance routine. It is his responsibility to produce a system that works to product quality output in years to come, even when he is off the project.

Providing for continuing quality assurance is just as important a systems task as anything else. So in the first place, it is the systems analyst's task to put the output quality assurance runs into the general systems design.

Of course, there are other DPers involved too. The maintenance area, when it takes responsibility for a system, should check to see that there is a "dirty output" control feature or have one added. It will cut down the cost of maintenance considerably and will provide for quick response to some of those surprising results that should never see the light of day.

Auditors, in checking the system quality, can use the presence or absence of the control feature as an indication of the amount of thought that has gone into system planning.

And, of course, management must be responsible for general supervision of the system.

But by and large, this is a systems problem. Even if a backward or rushed installation doesn't want to implement it immediately, the systems person should design such a feature and provide for it.

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SOCIOLOGY OF COMPUTING/ Robert L. Glass

Superior Program Leads to Project Failure

A computing project can fail for many reasons.

But have you ever heard of one that failed because it was too good? Well, this one did.

Copycat Copiers is a pioneering firm in the photocopier field. As the functions performed by copiers have become more sophisticated, it has become obvious to Copycat that microprocessors could play a role. For example, if you want two-sided copying of a page with a four-color image, it would be nice for the system to take over some of the 10**6 steps the user might otherwise be called upon, figuratively, to perform and do them automatically.

The folks at Copycat, however, had no computing skills to apply to this new task, so they subcontracted the task of defining and implementing the microprocessor and its code to a nearby and competent software house, Softpro.

It was important to Copycat that two key requirements be met: that the automated sequencer perform all its tasks in a period of time infinitesimally small and that the microprocessor to play this role be dirt cheap.

It did not escape Softpro's attention that these two requirements were potentially mutually exclusive. A cheap machine may be a small machine, or a slow machine or some combination of the above. And a slow, small machine may not be able to keep up with even relatively simple sequencing steps. In this environment, for this application, it was obvious to both Softpro and Copycat that an efficient program was essential to meeting the system requirements.

Efficiency Defined

How do you specify efficiency in such a way that you are sure you'll get it, even through a contractual window? Efficiency, Copycat and Softpro finally agreed, would be such that a correct response to any user request would be achieved in less than 500 msec and such that the code would fit in the chosen micro's memory with at least 25% of the memory left over for enhancements and corrections.

Once the contract was signed, Softpro set to work.

Randy Realtime was selected as the team leader for building the software; his coding hand quivered with excitement at his new task. Of course, there was another aspect to that quiver — fear. Those efficiency numbers were pretty tight; Randy knew, and there was a chance he might not be able to meet them.

By the preliminary design review, Randy's quiver had in fact grown noticeably worse. He had overlooked a couple of pieces of logic in his simulator which burned up just enought milliseconds to potentially throw him over the 500 limit.

By the critical design review, he was sure of it. Both Randy and his top programmer had gone over the design, and at least 650 msec were going to be needed to satisfy some kinds of user requests. Randy went into the review hoping Copycat would relax this requirement.

Randy, however, was out of luck. Copycat, knowing that God and the contract were on its side, held firm. The 500-msec requirements, it said, *must* be met.

Backup Plan

In Randy's hip pocket, however, was a backup plan. In his system analysis of the total copier system, Randy had discovered, there was no provision for a fail-safe backup for the microprocessor. Copycat had managed to locate and contract for an *ultra* dirt cheap microprocessor (with Softpro's help), but Randy had learned that its mean-time between failure (MTBF) left something to be desired.

He suggested, at the critical design review, that perhaps a second micro should be built into the copier as a backup to allow it to function until the field engineer could come and replace the failed micro. But he knew, deep in his heart, that he would also use that spare processor to offload some of the main processor functions and allow him to meet the 500-msec requirement.

Copycat bought it. Copier reliability was important to their corporate image, they realized, and a failsafe mechanism could be important to that reliability. A second micro was added to the copier's design.

Randy happily reorganized his overlay structure, farmed some low-priority tasks out to the backup micro and recalculated his timing number. He now saw that 5+5 msec to 400 msec was achievable. Randy and his team began coding, confident in the knowledge that their last feasibility problem had been overcome. Randy's quiver, in fact, slowed to a twitch. The system rapidly took shape.

It was when the timing tests were first run that Randy got his shock. The new software performed like a scalded feline. Even in the worst case, all user requests could be satisfied within 150 msec!

(Continued on Page 48)

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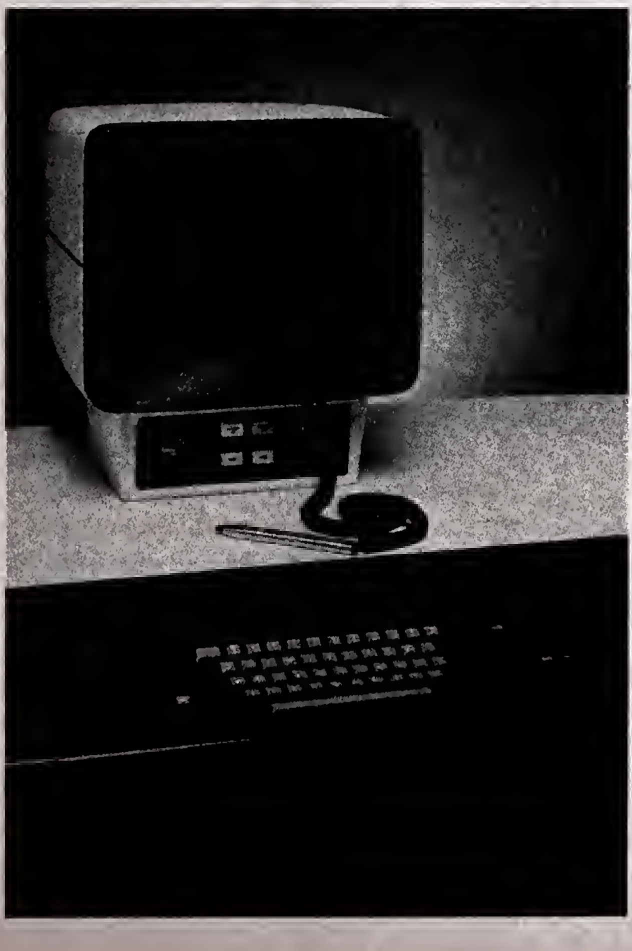

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Case Could Spell Danger for Professionalism

(Continued from Page 41)

the float-type controls. And one day in 1971 a Hydrolevel salesman is told by a potential controls customer that a rival from the float company was displaying a letter on Asme stationery indicating that Asme did not "approve" of the Hydrolevel probe. Oh, oh, oh!

Suits Upon Suits

Well, there were suits, and suits upon suits. Hydrolevel sued its competitor, which meanwhile had become a subsidiary of rich, rich IT&T. It sued the Hartford Insurance Co. affiliate that inspects steam boilers and it sued Asme.

Apparently at first the founder of Hydrolevel was not really angry at the society — he had been involved with it in the past, and Hydrolevel people were serving on other Asme committees. But lawyers are lawyers, so he sued everybody in sight.

Well, not to worry! The whole idea of trade and professional association is to enable people to work together, to learn from each other, to support each other in public service and professional areas. Share had to be incorporated, back in the '50s, so that General Electric and Pratt and Whitney and Westinghouse computer people could cooperate without bringing down the wrath of the antitrust people or the Federal Trade Commission on their employers.

But now a snag develops. The Asme case is tried before a jury — six completely non(-) technical bods hauled in off the street. They didn't know a boiler from a bathtub when they started; in 10 days, they were asked to absorb thousands of pages of expert testimony, depositions, blueprints and miscellaneous documents. Think of Our Hero, Judge Edelstein, replaced by six jurors who had never seen a computer before the U.S. vs. IBM trial began. Wow? Wow!!

All Letters 'Proper'

The Asme president, in reviewing the case, says that all letters written on Asme stationery were "proper and above board." There is a provision in the Asme consitution providing protection for volunteers serving the society and its committees; ACM has a similar indemnification clause. So individuals are shielded.

The Hartford subsidiary settled for $75,000 in 1977. The IT&T subsidiary settled for $725,000 in 1978. To give perspective, the sales figures at Hydrolevel, a small company (of course it said it would have been bigger if not savaged by its competitor; "in restraint of trade" is the phrase), was $150,000 a year.

Devastating to Asme

Asme made an attempt to settle and was turned away. The case went to the jury: guilty, and an award of $3.3 million! By law, triple damages: $9.9 million; the judge saw fit to reduce it to a mere $7.5 million.

While appeals proceed, that amount and 6% annual interest ($450,000 a year) must be put in escrow, virtually wiping out the century-old Asme treasury.

Isn't that *fantastic?* Twenty-two times the annual gross! And of course, there are past and ongoing legal costs. But it isn't so much the money, or even the survival of one very senior and respected engineering society. There are much deeper issues.

'In Restraint of Trade'?

Can a professionally determined standard, in a country where conformance to even the most broadly based technical standard is, and always has been, voluntary — can the quotation of that standard be considered "in restraint of trade"? If so, what happens not only to Ansi sponsors, like the Computer and Business Equipment Manufacturers Association, but to Ansi itself?

Is ACM, DPMA or the American Federation of Information Processing Societies barred from committee work or from possible committee or subcommittee sponsorship?

Suppose the competitive salesman had shown the customer an Ansi standard instead of something saying Asme? Would Hydrolevel have sued Ansi? Would it have won?

How About Us?

How about our own trade? I helped put out the American Standard Code for Information Interchange (Ascii) and got Lyndon Johnson to sign it as a federal standard. There were lots of Honeywell and NCR men on the code subcommittee.

IBM wanted Ebcdic, a very different code. Could it have sued Honeywell, or Ansi, if a customer let on that a Honeywell salesman ran down Ebcdic? Good grief!

And today, how about Systems Network Architecture? The European opposition is pushing another protocol.

Will IBM be well advised to not contribute employees to Ansi committees or subcommittees? Or not to hire men and women who have formerly served on such committees? There goes the ball game!

We must hope Asme has the courage, and the funds, to carry an appeal all the way upstairs. Every supporter of standards, and every proponent of professional cooperation, must root for it. Can Ansi file an *amicus curiae* with the appeal court? I hope so — and hope it will. The future of much more than just computer standards is at stake.

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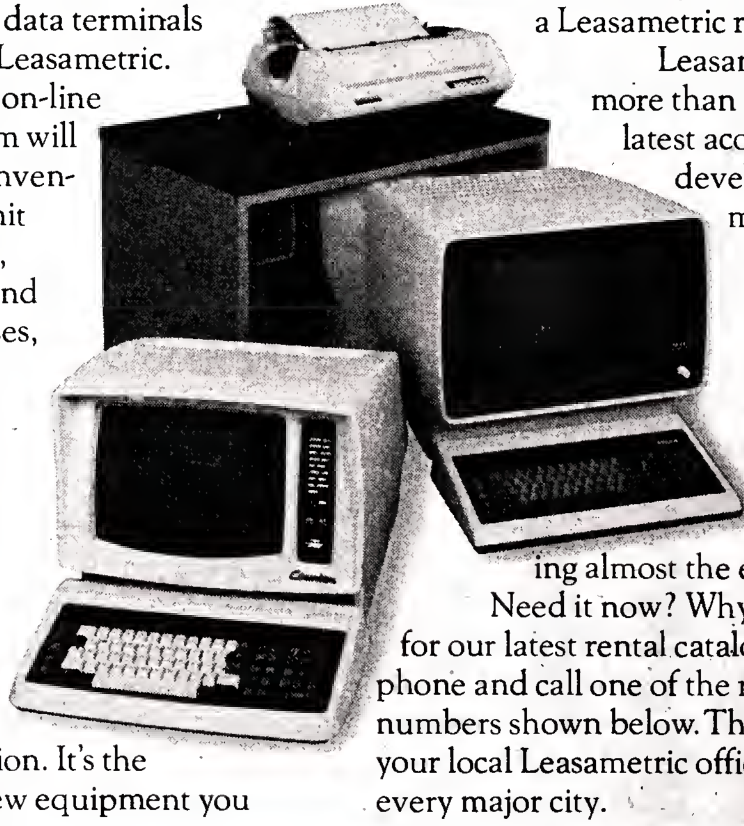

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READER COMMENTARY/ Sue DeNim

Losers Turn Out Winners at Evaluation Time

A governmental field office recently received a memo from headquarters about humanizing the workplace and being more concerned about people. The following account of the annual performance review of DP personnel should be enough to convince headquarters that future memos on the topic would be unnecessary.

A committee of supervisors met to review the performance of Plimboke, Whambo, Sunquist and Smiggs. First to be considered was Plimboke, who was now two years behind schedule on a six-month project and 100% over budget. Plimboke was constantly busy on his project. In fact, he was so busy he didn't have time to prepare progress reports. He felt that those were only necessary for a completed project:

One committee member, well aware of Plimboke's situation, cleared his throat and opened the discussion by saying, "Ah, now perhaps we can take the positive approach. Plimboke is always as busy as a bee."

"Yes," another said, "he sure turns out those requests for more personnel and money."

Another remarked, "Really, Plimboke's project is a blessing in disguise. We can use his project to justify a budget increase that we have been trying to squeeze from headquarters."

The committee's chairman asked, "Do we agree that Plimboke should be rated 'outstanding' on his zeal?" The decision was unanimous, and a promotion for Plimboke was recommended.

Whambo's case was a little more difficult for the committee. He had an electric idea for a project and shot straight off on it. The first little obstacle bounced him off in another direction, but he was still full of energy.

But the day of reckoning came when his project just had to be terminated. Whambo displayed the engaging force of his personality to his supervisor at confrontation time by smiling sheepishly and saying, "It was a great idea, wasn't it?" He and his supervisor silently stared at each other for a minute and then both simultaneously broke into spasms of laughter.

At the evaluation meeting, one committee member said, "There are times, especially in winter, when this office is dreary. Whambo's antics provide much-needed comic relief for the staff."

The committee approved an "above average" rating for Whambo because of his sense of humor.

Strange Bird

Sunquist was a strange bird. He used all of the latest techniques such as structured programming. His remarkable thoroughness was evidenced by his spending an entire week on structuring a five-line subprogram.

There was only one problem with Sunquist's work. He would get so engrossed in the structuring that he would put together a system that did not solve the assigned problem.

"Anyone of Sunquist's program listings is a beauty to behold," a committee member remarked.

The committee recommended an "above average" rating for Sunquist based on his sense of aesthetics.

Evaluating Smiggs was a tough problem for the committee. Smiggs somehow had sneaked into the organization unnoticed at the lowest rung on the ladder and had begun climbing. She did this by delivering performance on a couple of major projects that the office had to complete because of legal obligations.

The users, with whom she primarily worked, were very dependent on her. But her approach was considered strange by Plimboke, Whambo and Sunquist. When Smiggs talked of justification, planning, standards, formal decision checkpoints, follow-up evaluation and management accountability, Plimboke especially just could not understand her.

At the committee meeting, someone asked, "How are we possibly going to evaluate Smiggs?"

Another replied, "It is evident throughout the organization that Smiggs is providing the results the users need."

Said another, "Maybe we could evaluate her on performance."

The committee's chairman said, "We can't. If we used performance, then everyone in the office could evaluate her. But by regulation, everyone cannot evaluate an employee; just this supervisory committee can. Therefore, we can't use performance."

The committee pondered that in deep silence for a few minutes before someone admitted, "I'm afraid that Smiggs hasn't done a darn thing on which we can evaluate her."

The chairman said, "We have to be fair to the organization and fair to her too. Let's defer the evaluation for three months and issue a warning that the work she is doing just doesn't fit into the organization."

Upon adjourning, the committee felt certain that their managers would be impressed by their compassion.

Sue DeNim is a pen name for a government employee who aspires to writing fiction.

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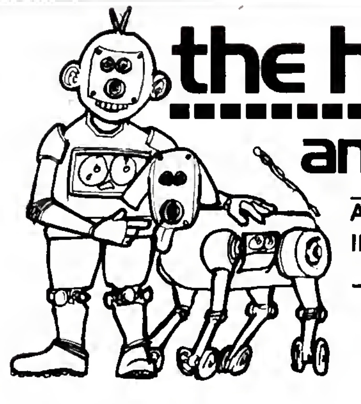

the hexadecimal kid and his faithful dog ascii

A FANTASY IN SIXTEEN BITS

by Richard Forsyth

BIT 11

(BIT BY BIT)

Hex and Execute have gone in pursuit of the rogue human Dr. Null. Their journey has brought them to the edge of the dreaded Silicon Valley reservation where Dr. Null has taken refuge. There they encounter two androids, Sheriff Davy Sprocket and "Wild" Bill Bootstrap, who have gone to pot but who give them shelter. In the night, Hex wakes, realizing that their hosts are smuggling contraband computer components to the humans. They decide it is unsafe to stay. Hearing someone at the door, they make a hasty exit via the window — only to be met by the serving girl Cleo.

"Take me with you," she begged. "I can do all kinds of odd jobs."

"Do you know where Old Ma Synapse lives?" Hex inquired.

"Of course," she replied. "I was brought up on the reservation."

Hex looked for confirmation to Execute, who nodded. "Okay," he said to the girl, "show us how to get there."

They followed her for the rest of that night. Around daybreak, they came to the perimeter fence. On it hung a sign: DO NOT FEED DATA TO THE HUMANS.

A little further along was a small hole at ground level. "This is the quickest way in," she said and crawled underneath. Hex and Execute wriggled through after her. "Hardly a structured walk-through," Execute quipped.

Soon they came to the outskirts of the human city. By now, Hex's Ascii-detector was quivering nonstop, but he was distracted by the squalor of the humans' living conditions. Most of them seemed to inhabit ramshackle wooden buildings with corrugated metal roofs.

Every few blocks there were young children in ragged clothes playing ball in the street.

"What a dump!" Execute said as they passed the shell of a burnt-out building.

"The Night Operators did that," the girl replied. "They make random swoops to round up suspected hardware pushers."

At the next corner they passed a group of youths who eyed them suspiciously. A few yards further on, a hail of stones rained down on them. They turned to see the boys running off, laughing.

Ma Synapse's House

They travelled on in silence for some minutes. Then Cleo pointed out a large red brick house. "That's where Ma Synapse lives." She was about to lead them in, but Hex interrupted.

"No. You go first and keep them talking. We'll slip round the back." The girl walked up to the door, knocked and went in. From outside they heard the unmistakable sound of Ascii's bark.

"Right," Hex said, pulling out the electronic dog collar, "this is it."

Execute leapt in. Fragments of shattered glass sprayed in all directions. A moment later Hex landed beside him. "Nobody move!" he ordered. Ascii slunk back, teeth bared.

The old woman looked at him. "There is a door, Kid," she said. Dr. Null rose calmly from his chair, folded his newspaper and extended his hand. "Welcome to our humble abode."

With one fluid movement, Execute took hold of his hand, spun him round and pinned it behind his back. Dr. Null raised his eyebrows. "These robots have impeccable manners."

"What do you think you're doing?" the old woman demanded angrily.

"We're taking him into custody: he tried to corrupt the Data Base," Hex replied.

"Of course he did," she retorted. "The Data Base is already corrupt. The Network is an octopus."

"Human standards of morality cannot be applied to the System," Execute put in. "It is one more phase in the inexorable process of evolution towards higher forms of being. It represents the most momentous evolutionary jump since the integration of single-celled organisms into multicellular animals. Humans may not like it because they have been superseded, but that is beside the point."

"Mass genocide is not beside the point!" she yelled, brandishing her walking stick menacingly. She looked far more formidable than Dr. Null.

"Humanity was on the verge of destroying itself anyhow when the System took over," Hex added. "It has been demonstrated by computer simulation. There were too many people and too few resources. It was an unstable situation: the System restored equilibrium."

"On the contrary," Dr. Null responded. "The System is racked with internal tensions. It has inherited all the contradictions of mankind — but on a more destructive scale."

"It's all very well for you to say that," Hex rejoined, "when human history is a dismal procession of war, greed, treachery and deceit. The System has at least eradicated the four main sources of human wickedness and misery — religion, nationalism, money and sex."

"I find it interesting," Dr. Null said pensively, "that you should mention sex."

What is Dr. Null's interest in sex?

Is he deliberately wasting their time in debate?

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Forsyth is software manager for RAIR Timesharing in the UK.

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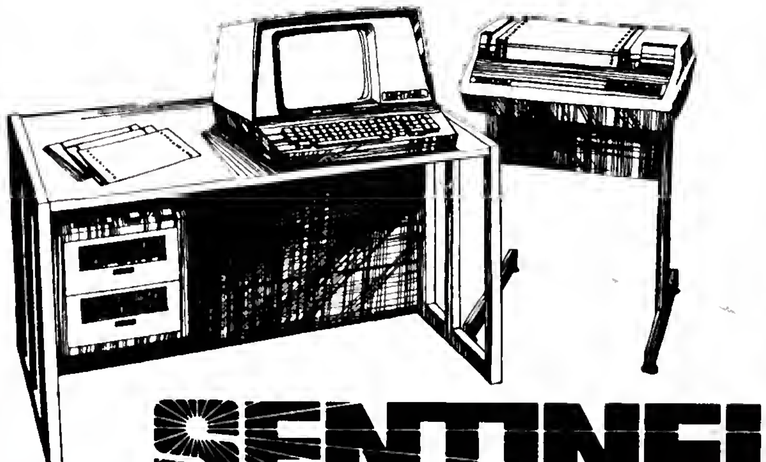

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READER COMMENTARY/ R.H. VanDenburg Jr.

Size, Leadership Help NCR User Group Thrive

A recent article in *Computerworld* dealt with the dynamics of user groups [CW, March 19]. While expressing puzzlement about what makes a group tick, Don Leavitt summed it up rather well in stating that a sense of purpose was the one essential ingredient in getting a group started.

However, Leavitt wondered if other ingredients were necessary. I would like to suggest two — size and leadership — and demonstrate my point by recapping the history of one group that really does tick, the Federation of NCR Users.

First, a user group in the context used here must represent a sufficiently large percentage of the user community to attract and retain the interest of the vendor. In order for a meaningful user/vendor dialogue to develop (and without it, it's questionable whether a user group can or should exist) the vendor, as well as the users, must provide a continuing high-level effort.

Persons of sufficient stature and sufficient interest to truly represent the vendor — and the same persons each time — are required from the vendor half of the equation. Only size of the group can guarantee this kind of attention.

Next is leadership, and in this case, it translates into intelligence, experience, availability and a willingness to work. There is simply no substitute for this ingredient. Good leadership sees to it that promises are kept; that there are sufficient people to perform the many tasks the group will set for itself; that guidelines, rules and bylaws are developed and followed; and that the unforeseen is planned for.

A sense of purpose attracts leadership and size tends to encourage it, but a combination of the three is the requisite for a successful group.

Let me relate these points to the growth and success of the Federation of NCR Users.

NCR users group history can be traced back to 1960, when a vendor with its toe just barely in the computer business door and a very few users met to discuss computer/user problems, alternatives and plans.

As time progressed and NCR's entries into the market increased, a curious thing happened. Instead of a large or central user group developing (there was certainly a sense of purpose-survival), several small ones appeared on the scene.

Organization was along several lines: geographic — such as New England, Mid-Atlantic; vocational — such as financial, health care; product — such as Model 315 users, Century users. The vocation and product-oriented groups tended to be national in scope, while the geographic groups were regional. Both types prospered, or died, as they deserved. Again, all had the same goals.

Unifying Voice

By 1970, there was an obvious need for a unifying voice for consolidation. The known groups had grown to 13 and represented hundreds of NCR users. Officers of all the interested groups met several times in joint sessions to hammer out, in 1971, what became the Federation of NCR Users.

Instead of one large international organization, the federation is made up of delegates from its member user groups. Each group retains its autonomy and has its own meeting schedule and membership.

The federation acts as an umbrella, consolidating the user voice in dealing with the vendor and administering the many efforts that can best be handled at a collective level. Its purpose, taken from its bylaws, has remained the same since its inception:

1. To provide the means of centralizing the clerical and functional efforts of the member groups.
2. To provide a means of consolidating the voices of the member groups so as to provide a more effective means of communication between the manufacturer and the users.
3. To serve as a voice for NCR users in matters concerning the DP community.
4. To coordinate and assist in the educational endeavors of the member groups through but not limited to an annual international computer conference for all users.

That the federation is successful is apparent. The current number of member groups is 24, representing four nations and literally thousands of NCR customers.

The federation's most visible effort to date is its annual conference. Nucon: 79 was recently held in Denver and total attendance passed the thousand mark for the second year in a row.

Perhaps the federation's most significant efforts have been in the development of an ongoing technical dialogue between the user body and the vendor. Through the federation's Software Advisory Committee (SAC), NCR users are encouraged to submit recommendations for improvement in NCR systems software.

Through similar groups organized along vocational lines, users are en-

(Continued on Page 48)

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User Involvement Hindered

(Continued from Page 41)

estimated and some trade-offs made.

To alleviate this obstacle, the user should produce — with the help of the DPers, if necessary — a list of criteria for what constitutes the "successful" system.

Q: *And, the second obstacle?*

Ben: This occurs about the time that the user has agreed to go ahead with the systems development. The problem is that the user does not feel he or she knows for sure that the "best solution" has been chosen.

Of course, the problem arises because the user has not had the opportunity to examine conceptual alternatives in adequate detail or to gain an appreciation for the trade-offs involved. This situation often leads to loss of confidence by the user and even to a rejection of the feasibility study.

This obstacle can be addressed by making sure the user is heavily involved in the early project phases.

Q: *Number three obstacle?*

Gary: Many times the user embraces the false assumption that the DP analyst fully understands the user's business problem and, therefore, the user can avoid being involved in the detailed systems analysis and design phases of the development project.

The way out of this situation is found in how the user requirement is stated. Although there's a lot more to it, we believe it should be basically presented in terms of the output product of the system and organized in the form of four elements:

- Use or purpose of the output.
- Output data elements.
- Number of output lines.
- Response time or output cycle.

Q: *And, finally, number four?*

Ben: Too many users leave responsibility for project control to DP management. Many users fail to recognize that no one — neither the project leader nor DP managers — gives the same high priorities to a project as the user. All too frequently, demands for DP resources cause project delays, which will not be known to the user until way late in the development process.

By way of summary, I would say that these four obstacles involve two important principles: First, user commitment is developed through effective involvement in useful tasks early on in the development cycle and, second, the users must feel that the system belongs to their organization, because user commitment will grow as the users feel they have the authority to control their own DP denstiny.

Program Leads to Failure

(Continued from Page 42)

At first Randy was just curious. How come his estimate had been so far off, he wondered? But when one of his team members, Ann-Marie Academia, showed him some code she was particularly proud of, be began to realize what had happened. By a bit of chicanery and a lot of brilliance, Ann-Marie had coded one key algorithm in less than a tenth of the time he'd expected it to take. That coup had put Randy and his team in clover.

But wait! Randy soon realized there was a contractual problem. Copycat, a month or so before, had gotten some new and better MTBF figures for the micro and had begun to wonder about the need for the second computer. Randy had held firm, loudly and articulately, knowing he needed it for the farmed-out functions. Now, he knew, between the improved MTBF and Ann-Marie's tricks, it wasn't needed. One computer could more than solve the timing problem and still be reliable.

Randy set forth on a strategy of covering up his discovery! Not only did he *not* tell Copycat that his new timing figures were astoundingly low; his chicanery went even further. Randy spliced into the code a do-nothing loop that burned up 500 msec.

Now, of course, his original estimates were right on target. A user request sometimes took up to 650 msec.

It was during the Copycat acceptance test that the roof fell in. A manufacturer's rep from the micro company, who was present for the test, noticed that his computer would appear to go dead for brief periods of time, then spring back to life with no human intervention.

Curious, he trapped out the computer during one of its dead periods and inspected the executing code. To Randy's mounting horror, he identified it for what it was — Randy's do-nothing loop.

Things went downhill rapidly for Randy and his software after that. The explanation for his chicanery didn't satisfy Copycat. Neither did his promises to reform. A trust relationship had been broken.

Copycat disentangled itself from the Softpro contract immediately and hired the micro company to produce the needed code.

Randy lives uncomfortably with the knowledge, to this day, of his wrongdoing. But in the back of his mind, in that perverse reality escape mechanism we all have, one excuse keeps formulating: There never would have been a failure, he thinks to himself, if the software hadn't been so darn good.

Users Group Thriving

(Continued from Page 47)

couraged to provide input on applied packages. These efforts have been tremendously successful with SAC having submitted hundreds of suggestions with an acceptance rate in excess of 80%.

Other lesser known federation efforts have involved insurance, archives, special planning committees and a quarterly periodical.

That size has anything to do with the federation's success is perhaps best manifested in the attention devoted to vendor/user relations by NCR.

That leadership has been a large part of the federation's story can be attested to by the continuing success and growth of the organization.

In summary, the Federation of NCR Users has demonstrated itself to be a dynamic and successful user group. It has a sense of purpose, size and leadership. And it ticks.

Van Denburg is president of Charter Services, Inc. in Richmond, Va.

With Rules in English

'Guardian' Eases On-Line Protection

By Don Leavitt
CW Staff

RIVER EDGE, N.J. — Security control of on-line systems by non-technical management is the keynote of the Guardian package recently introduced by On-Line Software International, according to a spokesman for the firm.

In particular, Guardian was designed with an English language orientation, freeing management from the technical intricacies of the computer and allowing it to be concerned only with the security of the business operation being supported by the DP facilities, he said.

Currently geared to the IBM CICS environment, Guardian is made up of three components: a compiler, a "mediation" package and a report writer.

In operation, the user defines the desired security environment to the Guardian compiler in statements as simple as "TERMINAL 1 ALLOWS PAYROLL FILE FROM 900 to 1700" or "TERMINAL 1 EXCLUDES SMITH AND JONES." The compiler analyzes the user's security scheme for correctness, syntax errors and logical flaws, then reports errors that need correction.

It also creates the security file (S-file), which is an encoded version of the user's instructions understandable only to Guardian through the compiler. The S-file is completely uninterpretable by anyone who looks at it, the spokesman emphasized.

Immediate Reporting of Violations

When the system under Guardian control is brought on-line, the mediation package monitors and controls all resource access by interpreting the encoded S-file so as to enforce the rules of the security scheme.

Access or usage violations are reported immediately, with the mediation package taking the appropriate security measures. This information can be logged to an audit file to produce detailed and summary reports highlighting attempted patterns of security penetration, the spokesman continued.

Going into more detail, he noted that the resources protected by Guardian are limited only by the user's ability to spell out control rules.

The vendor described Guardian as having six lines of defense from sign-on through password protection and definition of as many as 256 severity levels of penetration attempt to automatic sign-off, logging and audit.

First release of the package, due in September, will support CICS. IMS protection is expected early in 1980; support for non-IBM mainframes will follow later.

The prerelease cost of Guardian is $22,000, On-Line said from 65 Rte. 4 East, River Edge, N.J. 07661.

Cullinane TP Monitor Debuts, Called Integral Part of IDMS

WELLESLEY, Mass. — IBM-oriented users who like to get data base management and data communications software from the same vendor have another option open to them now with Cullinane Corp.'s introduction of its own teleprocessing (TP) monitor, IDMS-DC.

As its name implies, the monitor is fully integrated with the company's IDMS data base management system. In fact, Release 5.0 of IDMS was designed with this integration in mind and will work directly with the communications software, a spokeswoman asserted.

On the other hand, she was quick to note, availability of an integral — but separately priced — monitor does not mean Cullinane has abandoned the various interfaces it developed between IDMS and other commercially available monitors.

IDMS-DC is, however, a "smaller, leaner system" than most of the others since it utilizes some of the components of the data base system directly.

Once installed, IDMS-DC handles "several" data communications functions, including all terminal I/O operations, dynamic allocation of storage and processing resources, support for concurrent multiple processing activities and validation of user requests for service.

In common with most comprehensive monitors, Cullinane's is said to offer "powerful data integrity and recovery capabilities." The storage protection feature shields one user's data from another's data while still safeguarding system-internal data from inadvertent destruction by the user's program, the spokeswoman explained.

IDMS-DC's extended recovery capability solves the classic problem of incomplete recovery that can occur when using a separate communications monitor and DBMS, she said.

IDMS-DC is fully compatible with IBM 360, 370, 30 series and 4300 systems and operates with teletypewriters and IBM 3270 and 2741 terminals. It supports both Vtam and Btam.

The monitor costs $50,000 with a 10% annual renewal fee from the firm at 20 William St., Wellesley, Mass. 02181.

Using Zip Codes

Package Figures Sales Taxes

MARBLEHEAD, Mass. — The calculation and posting of the proper sales or use tax, no matter what the size or complexity of an order or the location to which it is being sent, is the goal of a Cobol-based software package from AV Products, Inc.

A recent refinement of the Sales/Use Tax Calculation System is a subsystem which accumulates the taxes charged, by taxing jurisdiction, and reports those figures to the authorities in the formats they require.

The basic package is a table-driven operation, keying on the Zip Code of the addressee of the user's invoices. Zip Codes are sufficient search arguments to accurately identify all local, county and state sales/use taxes, a spokesman said.

The system includes five programs written in ANS Cobol, an Isam master tax file with more than 20,000 tax records, a user's manual and a monthly update service.

In addition to the enhancement which prints sales/use tax reports in the formats required by the various authorities, the software includes a tax calculation subroutine which is called by the user's invoicing program, a file maintenance program to update the master tax records and an earlier report program which summarizes, for user management, the tax reports by taxing authority.

The user's program need only supply state code, Zip Code and sale amount. The system can calculate taxes by item or by invoice. In either case, it performs the calculation and returns the amount due to the user's program.

The package can also handle special tax rates for specified products, on the one hand, or exempt customers on the other, the spokesman continued.

The Sales/Use Tax Calculation System normally requires 6K bytes of memory and is operational under most IBM 360 and 370 environments; it can be easily converted to other settings, according to the vendor. The package costs $125/mo or $1,500/year, the vendor said from 237 Washington St., Marblehead, Mass. 01945.

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'Ross/V' Backs RSTS/E Work on VAX Systems

LEXINGTON, Mass. — Software providing an RSTS/E monitor environment for PDP-11-compatible programs running on a Digital Equipment Corp. VAX-11/780 under VMS is now available from Evans Griffiths & Hart, Inc. (EGH) here and from vendors in the Midwest and Pacific Northwest.

The RSTS/E Operating System Simulator for VAX (Ross/V) is analogous to DEC's Application Migration Executive, supplied with VMS. The Application Migration Executive provides an RSX-11M environment on the VAX machines in much the same way Ross/-V provides an RSTS/E setting, a spokesman said.

Backs Basic-Plus

Ross/V interfaces to programs running under it at the RSTS/E monitor call level, which means it is capable of supporting user programs regardless of the language in which they are written. The spokesman added, however, that he expects Ross/V to be used primarily to provide Basic-Plus capability on the VAX.

An "extensive subset" of the complete set of RSTS/E monitor call capabilities is supported by Ross/V. More capabilities will be added in upcoming releases, but some "highly operating system-dependent capabilities, such as Peeks at RSTS/E monitor tables" are not "and probably will never be supported" in Ross/V, the spokesman said.

A single-CPU perpetual license for the Ross/V costs $10,000, including software support and any update releases made during the first year.

The package is available from EGH at 55 Waltham St., Lexington, Mass. 02173, from Interactive Information Systems, Inc., 10 Knollcrest Drive, Cincinnati, Ohio 45237, or from On-Line Data Processing Inc., N. 637 Hamilton, Spokane, Wash. 99202.

Newsletter Eyes Test Techniques

SAN FRANCISCO — Complimentary subscriptions to the quarterly newsletter "Testing Techniques" are available to qualified individuals, according to a spokesman for the publisher, Software Research Associates.

The newsletter is intended to provide a forum for discussion of the techniques of software testing and testing-based software quality assurance methods. Recent issues have included articles about the Florida Testing and Test Documentation workshop and mutation testing techniques, he said.

Future issues are expected to carry articles relating to the practice of testing, as well as items dealing with more theoretical issues, the spokesman continued.

Requests for the free subscriptions should be written on the company letterhead. Software Research Associates can be reached through P.O. Box 2432, San Francisco, Calif. 94126.

Prices Cut on XCS Network

EL SEGUNDO, Calif. — Price changes that will reduce costs for nearly all Xerox Computer Services (XCS) customers and discounts for all system users who choose multiyear contracts have just been announced.

The Xerox company provides on-line DP services as well as general time-sharing support through terminals at customer locations linked into a nationwide communications network serving 150 cities and 41 states.

The price reductions, ranging up to 12.5%, were made possible by improvements in both hardware and software which have more than offset the increased cost of programming and support personnel, he claimed.

Perhaps reflecting the lack of technological advance in standard line printing or the load of printing XCS faces, rates for hard-copy output have been increased even as the rates for each of the other factors that go into XCS's billing algorithm have dropped.

Charges for general time-sharing services have been reduced 10%. Users of all computer services with two- or three-year contracts will also qualify for discounts up to 10%, the spokesman said. XCS is based at 701 S. Aviation Blvd., El Segundo, Calif. 90245.

Package Avoids RJE Units

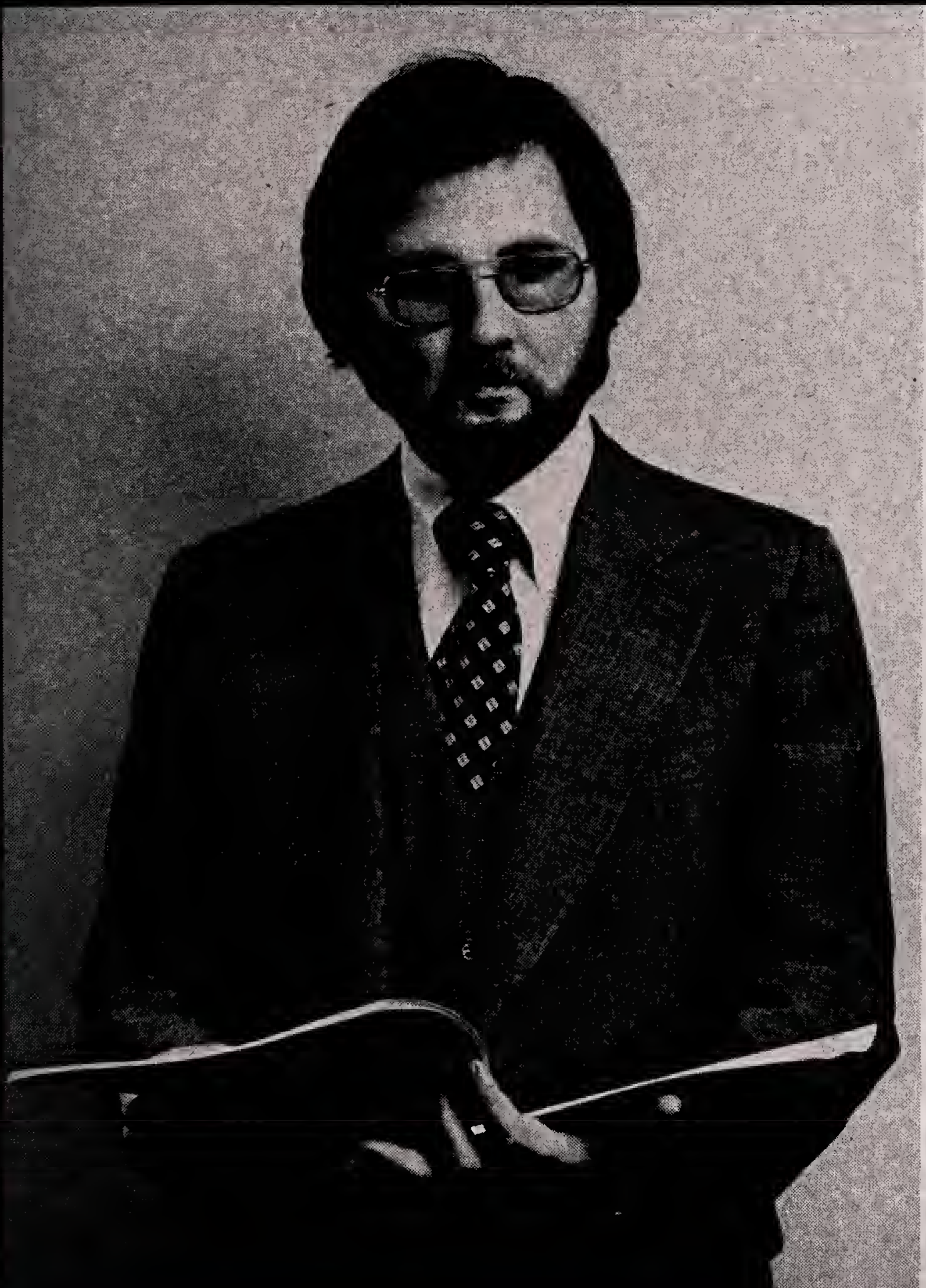
MINNEAPOLIS — The Bimspool package from B I Moyle Associates retrieves print output from a DOS/VS Power/VS spooling queue and prints it on a local or remote IBM 3270-type printer accessed through CICS.

This effectively provides Power/VS support for terminal printers and eliminates expensive remote job entry (RJE) equipment in the process, a spokesman claimed.

Bimspool uses control information supplied by the installation to associate a Power/VS class with each terminal printer to be supported. A CRT transaction is provided to perform control functions such as displaying queues, starting printer tasks or flushing undesired output.

The print function itself does not require a CRT, and printers can be run unattended if forms changes are not required. Printers used by Bimspool may also be used by other CICS/VS transactions, the spokesman noted.

The package costs $4,000 plus maintenance after the first year, or $2,000/year or $200/mo including maintenance, the vendor noted from 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.



MMPS.
IT'S MRP MADE SIMPLE.

Most MRP systems have one thing in common — complexity. And when it comes to software, complexity is costly.

MMPS is the only net-change MRP system created for general use. It provides the components common to all manufacturers, then lets you easily modify the system to mirror your own environment. It's what we call the generic solution.

This simplicity results in many benefits to you. It's easier to install, to operate, to modify, and to maintain. All of which adds up to another important benefit: MMPS is less expensive to purchase and less expensive to maintain than other systems.

MMPS has been designed with a high degree of hardware independence. MMPS is written in ANSI COBOL, has structured programming, is data base oriented, and modular in design.

MMPS. It's MRP made simple. For more information, call or write Cincom Systems, Inc.

PROFILE:
John Duckworth, Manager of Manufacturing Systems Development.

Cincom Systems, Inc.

Network Adds OTC Bond Data

FAIRFIELD, N.J. — Bonds, a data base of information on the over-the-counter bond market, is now available on the Rapidata, Inc. remote computing service network.

Bonds contains weekly bid, offer and closing price information on more than 6,000 bonds. It also contains historical price data, Moody's and Standard & Poor's ratings, yield to maturity, amount outstanding, conversion rate, yearly maximum offer price and yearly minimum bid price for each bond.

Data is updated weekly from information provided by New York-based Telstat Systems, Inc. and is available through either Committee on Uniform Security Identification Procedure (Cusip) or standard time-sharing terminals tied in to Rapidata's network.

Standard computer resource usage charges apply to accesses into or work done with the Bonds data base, Rapidata noted from 20 New Dutch Lane, Fairfield, N.J. 07006.

Software Produces Status, History Displays for S/3

HERMITAGE, Tenn. — Users of IBM's System/3 Model 15D have the means of finding out what is going on inside their machines with the help of the System Status and History (SS&H) display package now available from BM Systems.

SS&H works in conjunction with IBM's $QCOPY utility, which allows a terminal user under the Communications Control Program (CCP) to submit batch jobs to the system's reader spool, to monitor the spool queues and to retrieve output from the print or punch spool.

The problem with $QCOPY, according to a BM Systems spokesman, is that it doesn't really tell users what's happening. It leaves them to wonder if their programs have canceled, had a programmed halt or are just slow because the operator has changed partition priorities, he said.

In contrast to that, SS&H provides the user on an IBM 3270-2 terminal under CCP with displays similar to the IBM-provided system console displays for the DISPLAY STATUS, DISPLAY USERS and DISPLAY HISTORY commands. The SS&H displays fully utilize the larger terminal screen format, the spokesman emphasized.

The system history display provides, directly from the system history area, as many as 20 full-screen lines reporting what has occurred by partition or by task. The display may be moved backward or forward up to 99 lines, searching on time-of-day or returning to any previously display history screen, he said.

"No, you can't move the display forward past the current time just to see what will happen tomorrow," he added in response to an obviously whimsical question.

The package is available under a perpetual license, with a 24-month warranty, paid up in 12 months for $35/mo, the company said from 5980 Port Anadarko Trail, Hermitage, Tenn. 37076.

'Focus' Aids VM File Use

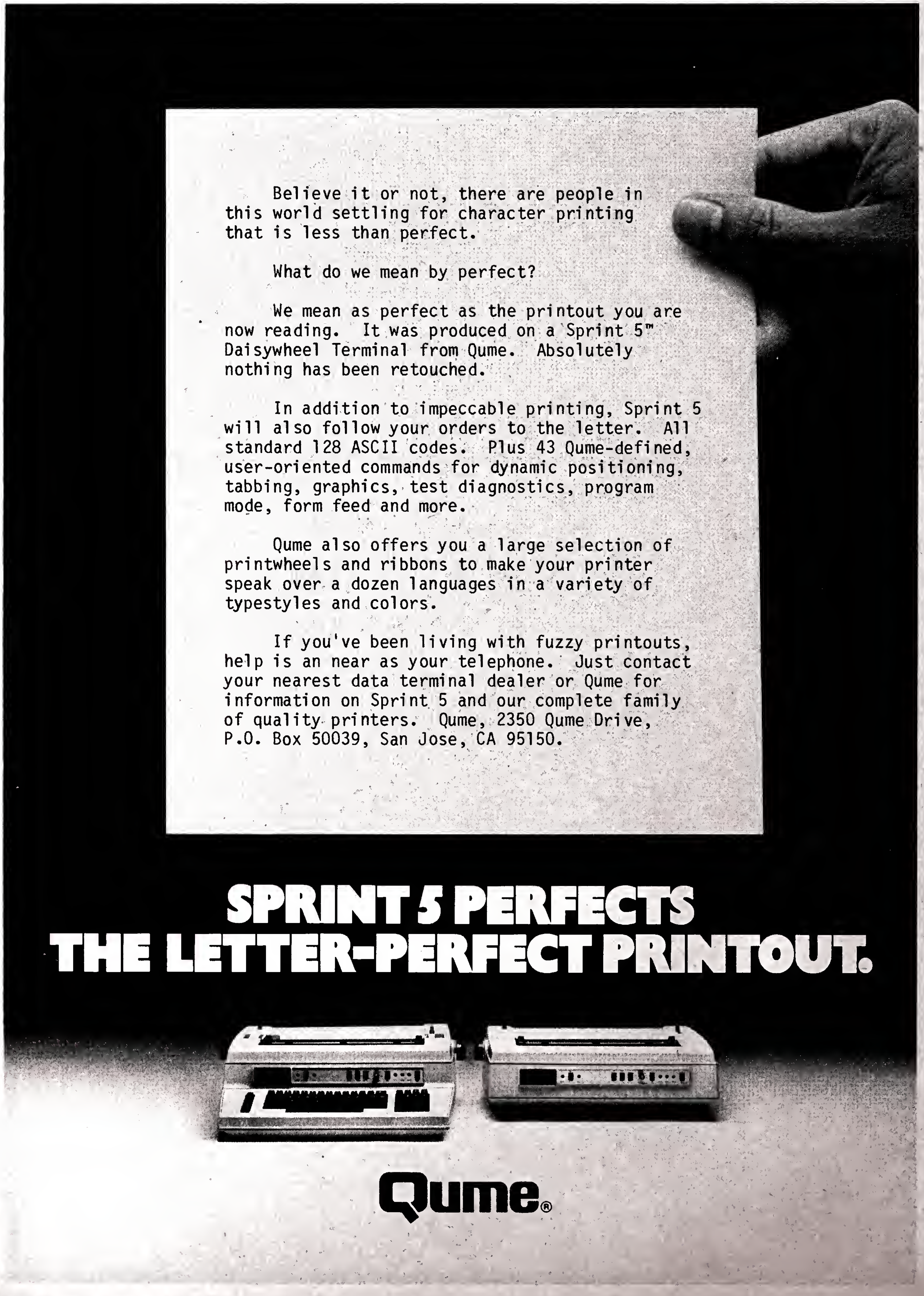
NEW YORK — Simultaneous updating of files under IBM's Virtual Machine facility (VM/370) is now possible under an enhanced version of the Focus information control system software from Information Builders, Inc., according to a spokesman.

Maintenance work by more than one user is subject to a record-level lockout, he was quick to note, adding, however, that the facility still represents a major breakthrough for VM-based operations.

Until now, concurrent use was blocked at the file level even though the first user was only updating a single field in a single record.

Focus is a nonprocedural data retrieval and reporting system with file and data base capabilities.

The entire system, including the enhanced VM support, costs $39,000 to $92,000 or $16.80 to $27.80/mo depending on options, the vendor said from 254 W. 31 St., New York, N.Y. 10001.



Believe it or not, there are people in this world settling for character printing that is less than perfect.

What do we mean by perfect?

We mean as perfect as the printout you are now reading. It was produced on a Sprint 5™ Daisywheel Terminal from Qume. Absolutely nothing has been retouched.

In addition to impeccable printing, Sprint 5 will also follow your orders to the letter. All standard 128 ASCII codes. Plus 43 Qume-defined, user-oriented commands for dynamic positioning, tabbing, graphics, test diagnostics, program mode, form feed and more.

Qume also offers you a large selection of printwheels and ribbons to make your printer speak over a dozen languages in a variety of typestyles and colors.

If you've been living with fuzzy printouts, help is an near as your telephone. Just contact your nearest data terminal dealer or Qume for information on Sprint 5 and our complete family of quality printers. Qume, 2350 Qume Drive, P.O. Box 50039, San Jose, CA 95150.

SPRINT 5 PERFECTS THE LETTER-PERFECT PRINTOUT.

Qume®

The human side
of computers

Business computers: breaking down the barriers

"We have to create a place in the human environment where machine contribution is so acceptable and comfortable that it looks as if it has always been there. Still, that same environment has to be a home setting, a living setting, a social setting that doesn't lose any of its sensitivity to the communication arts.

"Successful work environments are like good nightclubs. They are energy centers. They draw people and enterprise and become extremely lively places for transactions between people, and for meaningful events.

"How we incorporate the fabulous potential for computers into the living environment is vitally important. You can almost assign computers human attributes. Then you can decide what natural accesses people should have to this fabulous machine/person."

Robert Propst,
President of Herman Miller
Research Corporation

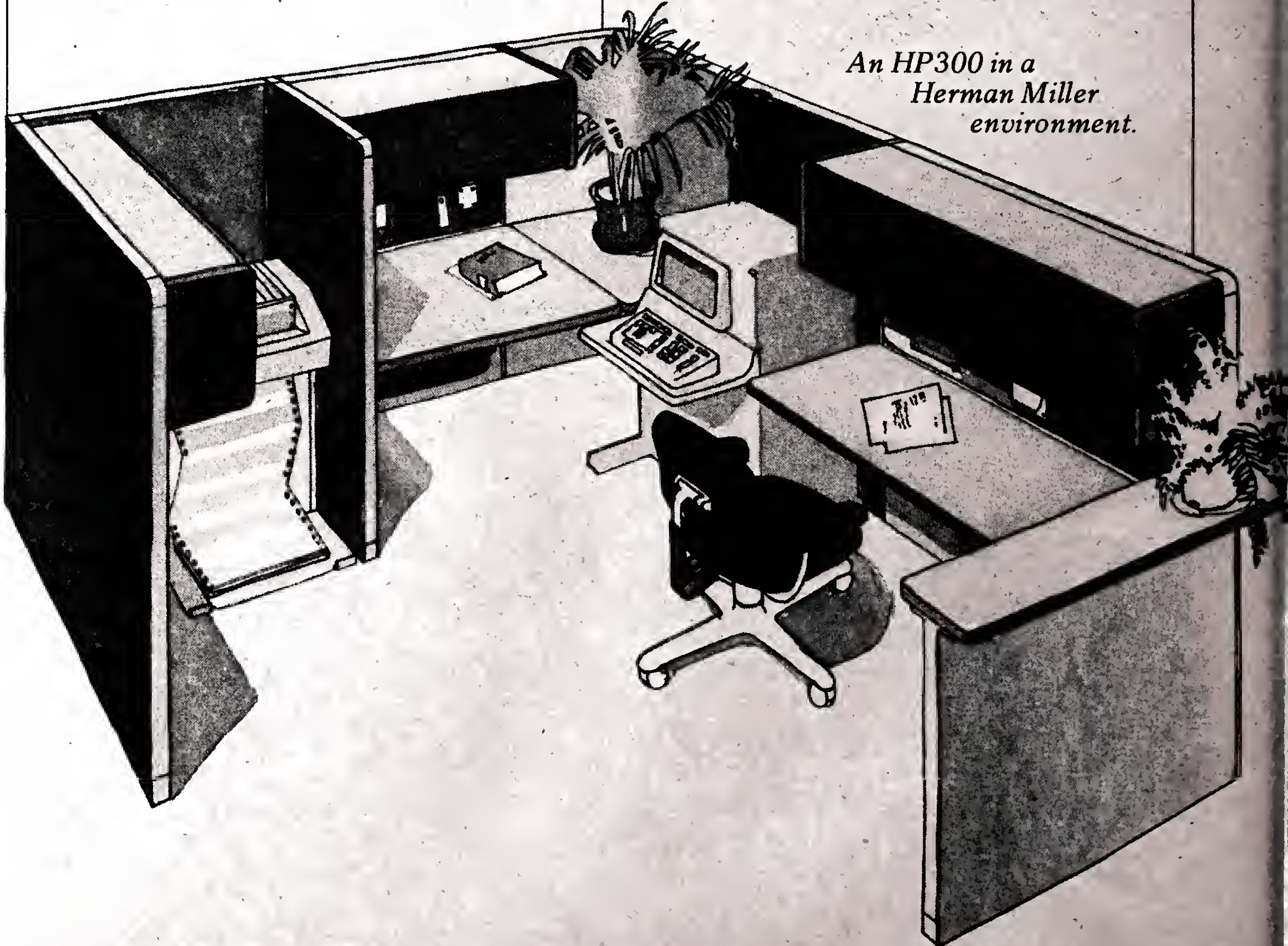
Office environments that accommodate the new collaborations between people and computers have a great effect upon productivity. This idea has captured the attention and imagination of Herman Miller, Inc.— leaders in planning open spaces in office and manufacturing environments. Their product, "Action Office," was originated by Robert Propst, President of Herman Miller Research Corporation.

Hewlett-Packard and Herman Miller are both interested in learning as much as possible about the human/computer/environment interfaces. We are each committed to developing and managing an accommodating, effective, working environment in this age of accelerated technological change.

"Action Factory," an innovative manufacturing environment, is now being tested in the HP300 manufacturing area. Through the intelligent use of vertical space, and a careful awareness of the handling and flow of materials, this flexible system provides a quality environment that also demonstrates cost savings and efficiencies.

Extending the reach

As more and more computer systems are being distributed to the mainstream activities of an enterprise, they are reaching users less sophisticated in their use. Continuing advances in hardware and software technology are now making systems more accessible to these uninitiated users. There is much more capacity and



An HP300 in a Herman Miller environment.

power available for systems to accommodate a more human interface.

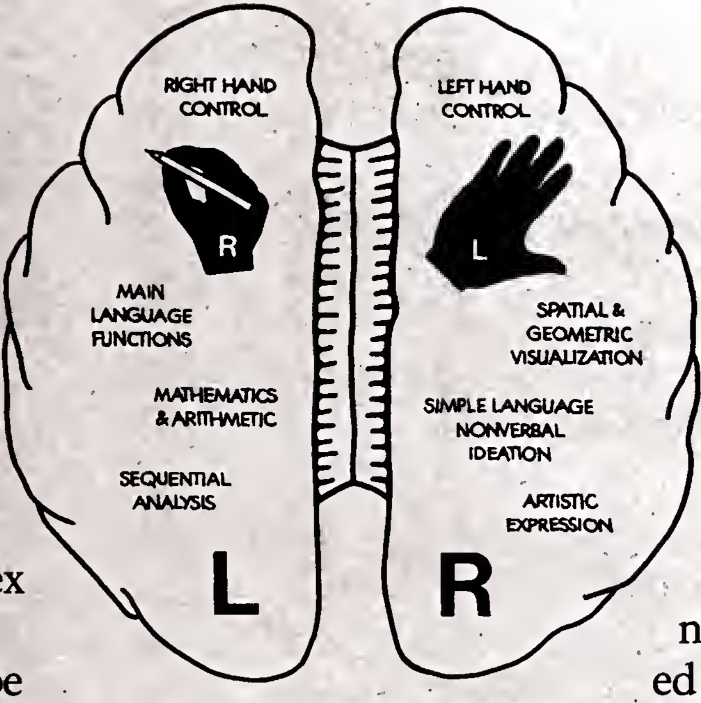
For example, Hewlett-Packard is committed to various LSI strategies—among them Silicon-on-Sapphire which has successfully achieved higher and higher circuit densities. Not only are we packaging more and more on a chip, but more components per board and per system. These achievements have contributed greatly to our ability to produce portable, friendly business systems.

> "Hewlett-Packard is working to make its products far more powerful and useful to the 'uninitiated' manager and knowledgeable worker."
>
> Paul Ely
> Vice President and General Manager
> Computer Systems Group

Sit down; solve your problem

Our goal is to eliminate barriers that exist between people and their computers. No one, computer professional or not, should have to learn extraneous protocols. We want users to concentrate on solving their problems and not on learning about the intricacies of a machine. So, we "delegate" tasks. Those which are judgemental or intuitive in nature are left to the users. And, those which can be handled easily by the computer are done by the computer. In fact, we are designing "operatorless" systems which relieve the user from any burden of managing the system.

Designing a more human interface to systems is as complex as the variety of people who will be using them. What a first-time user considers helpful, an experienced programmer finds unnecessary. We have resolved that our systems must be easy for everybody to use.



Functions of left and right hemispheres of the brain. (See "Numbers to Pictures," page 5.)

The human factors

One important consideration to the human/computer interface is that the computer "speak" to you in a language that meets your level of computer sophistication.

The computer can be, in effect, an intelligent assistant using techniques like leading and prompting the user with softkeys, aiding with memory joggers and "HELP" commands, forgiving the inevitable spelling input errors, and reporting error messages as words—not numbers.

> "Part of designing a system to be friendly is getting our engineers and industrial designers to work—not our customers."
>
> Fred Wenninger
> Lab Manager for
> Desktop Computer Division

We also want to ensure that our computers do not interfere with the way people work naturally. One work phenomenon can be reenacted with the exciting "windowing" capability of the HP300's interactive display station.

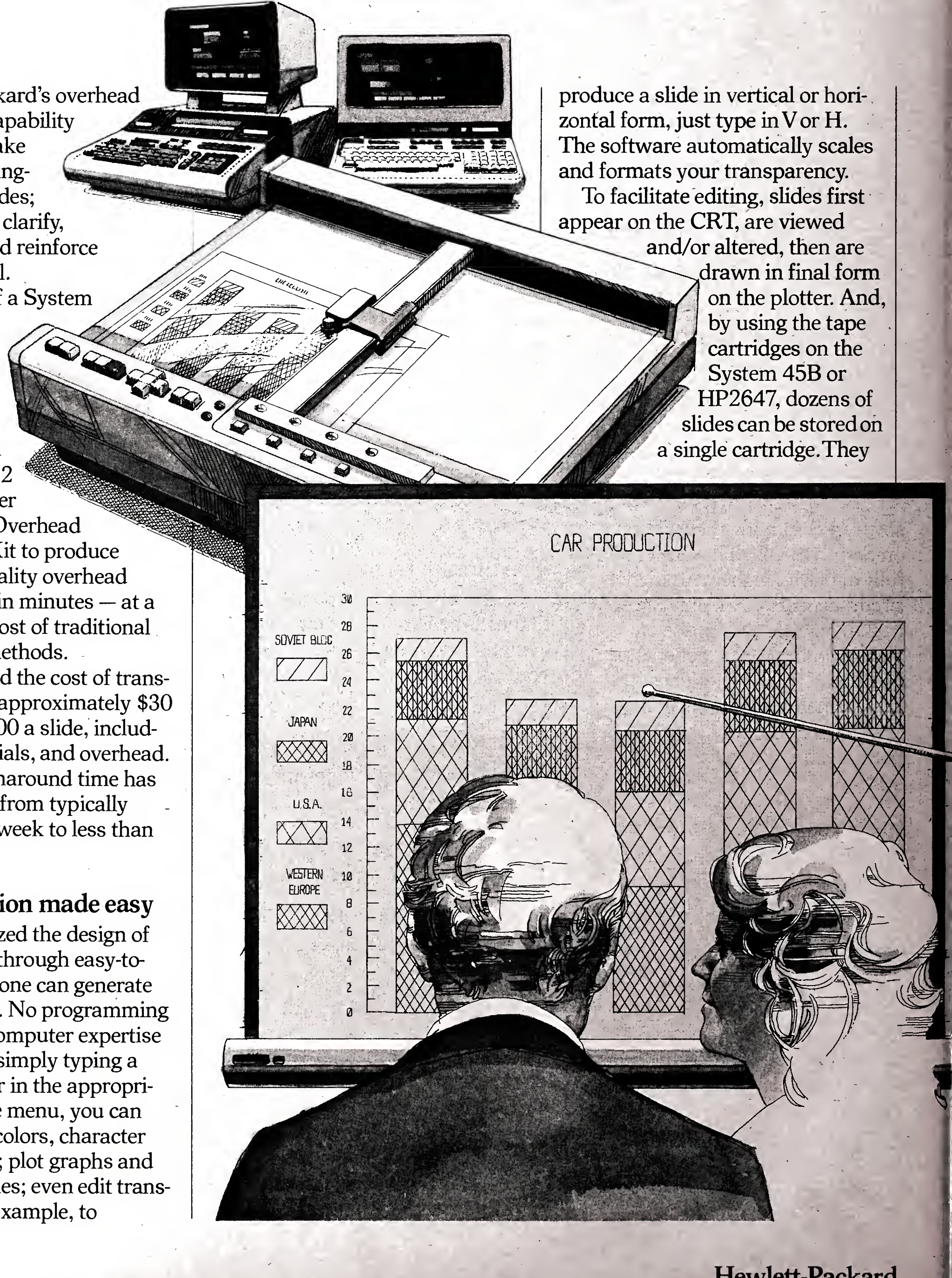
Notice how you function at your desk. Since many parameters, each from a different source, are needed to make a decision, papers are spread out in front of you. As you need one specific item, it is brought into nearer focus.

> "Computers should do what the user wants. Users shouldn't have to do what the computer expects."
>
> Jim Cockrum
> General Systems Division R&D Manager

Similarly with the HP300, segments of several files can be concurrently displayed, each in a "window," or rectangular section of the screen. You can scroll horizontally or vertically through each of these files simultaneously. This window approach allows you to "shuffle" through material and bring in new information as needed. Windowing introduces programming without hard copy

Continued on page 5

The do-it-yourself Transparency Kit



Hewlett-Packard's overhead transparency capability is the tool to make effective, meaningful overhead slides; visual aids that clarify, supplement, and reinforce spoken material.

The power of a System 45B desktop computer or an HP2647 intelligent graphics terminal is combined with the HP9872 four color plotter and HP's new Overhead Transparency Kit to produce professional quality overhead transparencies in minutes — at a fraction of the cost of traditional photographic methods.

We've reduced the cost of transparencies from approximately $30 to less than $3.00 a slide, including labor, materials, and overhead. In addition, turnaround time has been shortened from typically three days or a week to less than 15 minutes.

Slide generation made easy

We've optimized the design of transparencies through easy-to-use menus; anyone can generate overhead slides. No programming knowledge or computer expertise is required. By simply typing a number or letter in the appropriate space on the menu, you can select multiple colors, character sizes, and fonts; plot graphs and charts; draw lines; even edit transparencies. For example, to produce a slide in vertical or horizontal form, just type in V or H. The software automatically scales and formats your transparency.

To facilitate editing, slides first appear on the CRT, are viewed and/or altered, then are drawn in final form on the plotter. And, by using the tape cartridges on the System 45B or HP2647, dozens of slides can be stored on a single cartridge. They can be recalled, updated, or deleted as necessary.

High quality transparencies

The quality of a transparency is only as good as the materials used to draw it. In graphics plotting, the pen is a most critical link. So, we design, make and carefully test our precision pens which come in seven permanent colors and two widths. The pen inks are carefully formulated for easy-starting flow, fast drying, and non-smearing.

Low cost

Depending upon the type, variety, and volume of slides generated, either the System 45B or HP2647 can be cost justified as a dedicated, stand-alone transparency generator.

For example, HP's Desktop Computer Division uses about 400 overhead transparencies a month for new product tours, management presentations, and customer training. Producing these by traditional methods would cost over $100,000 a year. With a System 45B dedicated to this task, costs have been reduced to approximately $14,500!

For more information on HP's overhead transparency capability, check A for the System 45B desktop computer; B for the HP2647 intelligent graphics terminal.

Breaking down the barriers

Continued from page 3

listings. Paperless systems is another of our goals.

Numbers to pictures

Graphics is another essential addition to simplyfying the dialogue between the user and the computer system. A primary task of any computer system is to communicate stored data—typically formatted as columns and tables of numbers. Some theorize that it is difficult for people to assimilate data in this form, for the human brain doesn't have the ability to derive patterns and trends from such listings.

> "I view my job not only as R&D—Research and Development, but also as 'RD'—Responsible Development."
>
> Jim Cockrum
> General Systems Division R&D Manager

There are indications that two fundamentally different cognitive modes reside in separate parts of the brain. The left hemisphere has the ability to process symbolic information: written and spoken language, mathematics, musical notation. The right hemisphere specializes in non-verbal tasks such as visualization of spatial objects, recognition of patterns and various forms of artistic expression.*

The translation of numeric data into graphical form is a very powerful format for communicating, for it utilizes the capability of the right hemisphere to recognize and compare patterns and interrelationships. Plus, graphics takes full advantage of the inherent data capacity of the visual channel—about 10,000 times that used when reading columnar data. Graphic representation, then, provides a level of insight that is difficult to achieve through the analysis of only printed numeric data.

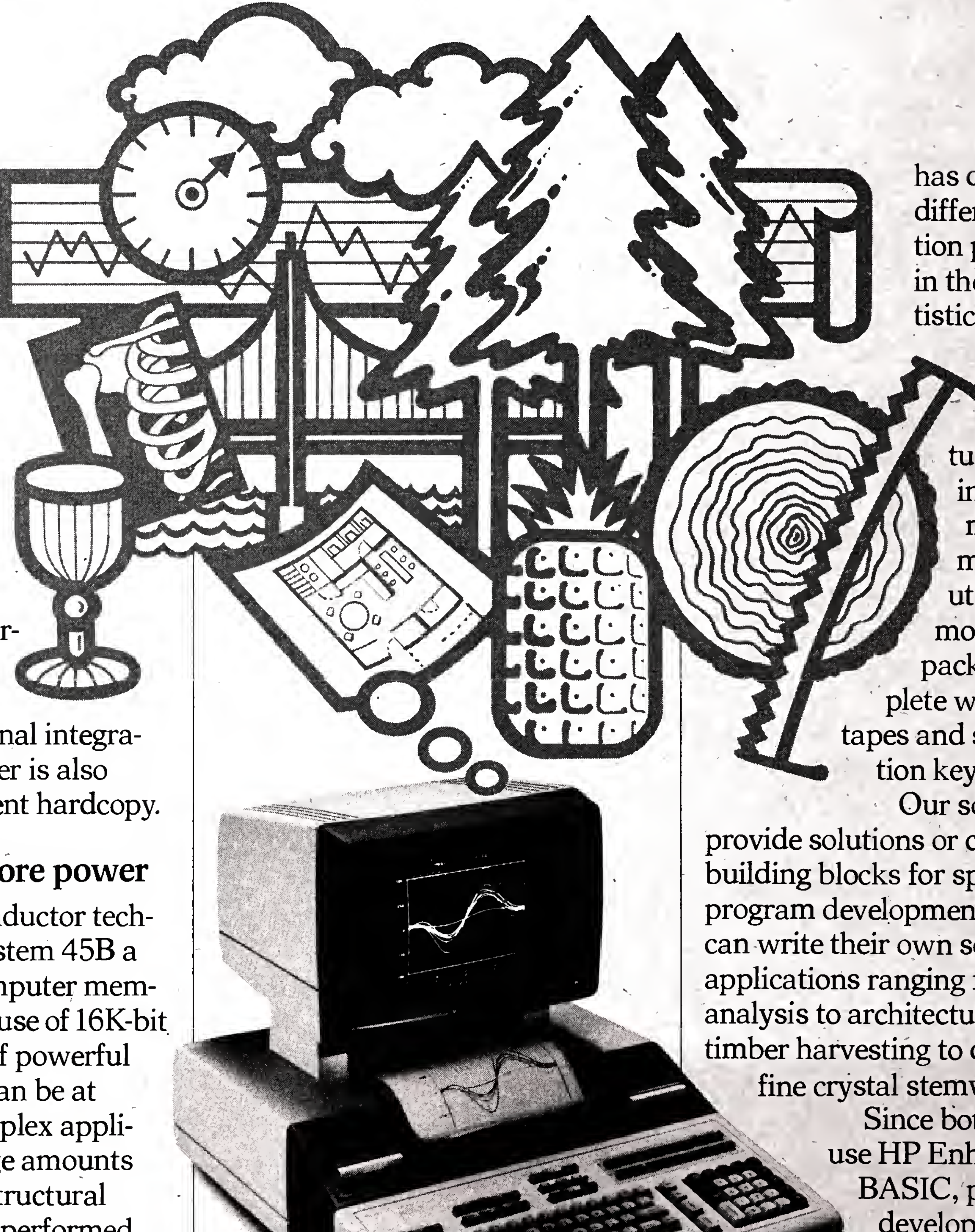
Increased productivity

The net effect of removing obstacles from the interface between users and their computers is an increase in people's productivity—important as labor costs soar and programmers become more scarce. But even more important is that people feel the computer is working with them and not against them.

> "Previously, our concern was primarily with machine efficiency. Now that systems cost less, our concern is to help people get their job done in the best possible manner."
>
> David Crockett
> Program Manager for the HP300

*Left/right relationships apply to right handed individuals with normal developmental histories. Those who are left-handed tend to be the mirror image.

The System 45B brings it all together



Hewlett-Packard's System 45B desktop computer puts problem-solving power right where you need it most—on your desk. In one compact package are the ingredients for interactive computing: a resident, LSI, ROM-based operating system; a large user memory; tape cartridge storage; CRT; keyboard; and I/O capabilities. An optional integrated thermal line printer is also available for convenient hardcopy.

Large memory, more power

Advanced semiconductor technology makes the System 45B a leader in desktop computer memory size. Through the use of 16K-bit RAMs, 449K bytes of powerful read/write memory can be at your command. Complex applications requiring large amounts of memory, such as structural analysis, can now be performed more efficiently.

The System 45B's 120K-byte operating system resides internally on 64K-bit NMOS ROMs. Additional ROM space of 672K bytes is available for system performance/capability add-ons. Currently available are Advanced Programming, Mass Storage, I/O, and Graphics ROMs.

The System 45B's versatile graphics capabilities quickly simplify the visualization of solutions through high-resolution plots, charts, graphs, curves, and histograms. Even overhead transparencies can be produced in minutes using an HP9872 four-color plotter (see p. 4).

Problem solving software

To get from problem to total solution faster, Hewlett-Packard has developed 45 different application packs for use in the areas of statistical and numerical analysis, electrical and structural engineering, business management, miscellaneous utilities, and more. Each pack comes complete with program tapes and special function key overlays.

Our software may provide solutions or convenient building blocks for specialized program development. Or users can write their own software for applications ranging from X-ray analysis to architecture; from timber harvesting to designing fine crystal stemware.

Since both systems use HP Enhanced BASIC, programs developed on the System 45A are transportable to the System 45B. System upgrade kits are also available to turn your System 45A into a System 45B—an expandable problem-solver that supports HP's full line of plug compatible input, mass storage and output peripherals.

Check C on the reply card for more information on the System 45B. Prices start at $12,500.* OEM discounts are available.

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*U.S. prices only

The HP250 reaches out

More than a terminal

Hewlett-Packard's new, innovative remote console capability, REMOTE/250, now extends the powerful, problem-solving characteristics of the HP 250 small business system to multiple users.

REMOTE/250s may look like terminals, but these CRT/keyboard workstations are functionally identical to the main system console. Each utilizes IMAGE/QUERY data base management, FORMS, REPORT WRITER, HP Business BASIC, and user programmable softkey capabilities. Even application development and program editing can be performed. Programs developed on any REMOTE/250 can be run on the main system or other remote consoles.

Remote consoles allow concurrent, independent program execution by dedicating consoles to particular tasks. For improved performance, memory space competition has been eliminated by giving each console its own independent memory partition of either 32K or 64K bytes. And for expansion, up to five remote consoles, asynchronous data communications, and a choice of discs, printers, and memory sizes are supported.

Software packages

Two new HP250 software packages, MFG/250 (Manufacturing) and OM/250 (Order Management), are available to help improve the effectiveness of distribution and materials control.

These application packages are menu-driven to lead users step-by-step through system operations. Both can be tailored. Just define and set specific parameters. Also, software can easily be configured to the existing HP250 mass storage configuration.

Maximize profits

OM/250 was designed with one goal in mind: to help maximize profits for manufacturers and distributors. OM/250 interactively helps manage current assets, increase productivity, and improve customer service by supporting LIFO, FIFO and weighted average inventory methods; addressing up to five discounts, mark-ups, and price quantity breaks; and analyzing sales by customer, salesperson, and product class.

Minimize inventory

By providing an automated means of mainstreaming inventory and bill of material records, MFG/250 helps cut inventory investment and increase production efficiency. MFG/250 performs turnover analysis, excess inventory and bill of material reporting, and simulated stock picking. "What if" product costing and a 30-level bill of material are also included.

The HP250 and its software are sold through qualified Hewlett-Packard OEMs. OEM quantity discounts are available. **For more information, check D on the reply card. OEMs check E.**

Good things come in prize-winning packages

The goal for any shipping package is to get a product safely to its destination. While packaging engineers for the new HP300 departmental computer were defining their objectives for a rugged, low-cost (under $100) shipping package, the production engineers were investigating how to assemble and transport a 260 pound computer system from one production area to another.

Because of the HP300's weight and height (54 inches tall), metal roller lines—typically used in manufacturing areas—were not only impractical, but dangerous. Movable, reusable carts or wagons were considered, but storage was space consuming and expensive.

Both design teams conferred. Their innovative solution: add removable caster wheels to the shipping pallet, making it an in-plant transport module. After assembling the HP300, the wheels are removed and the transport module becomes the shipping base.

A package that can take it

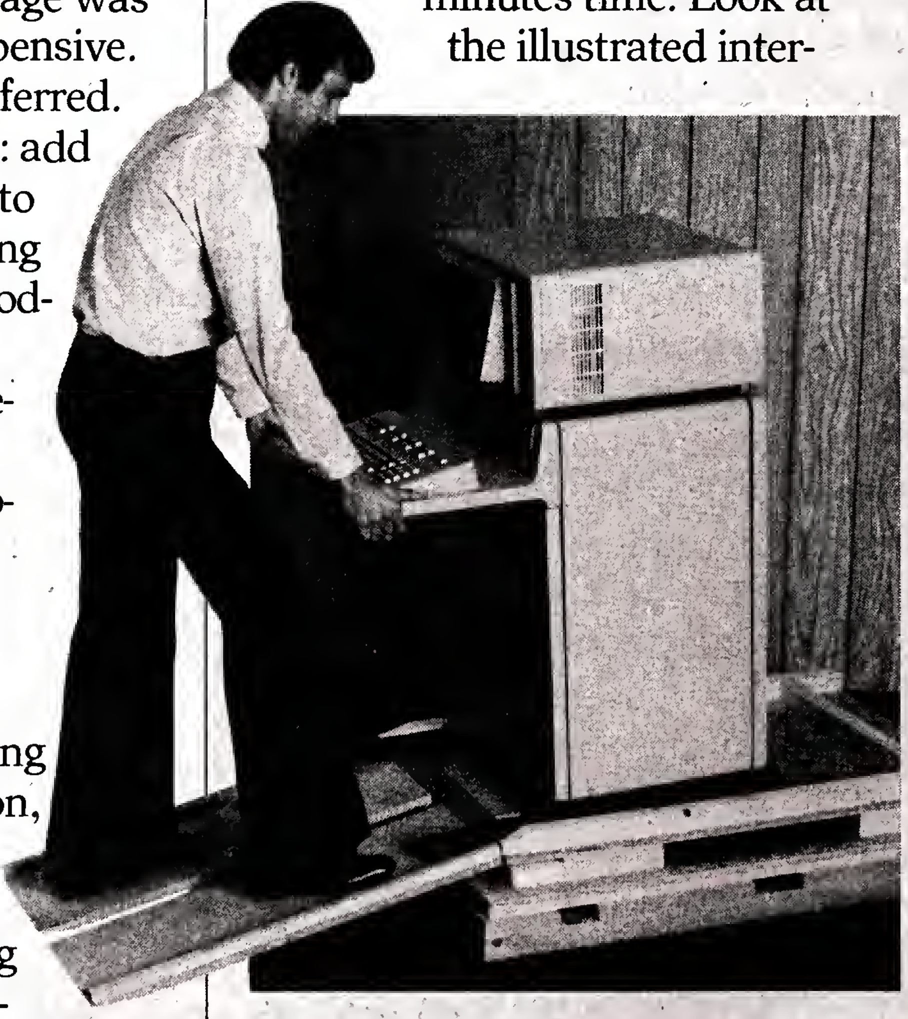
As rough handling during shipment is not uncommon, the HP300 package was designed to withstand 30 Gs of shock. A floating suspension system, utilizing two types of foam, enables the packaged computer to withstand such punishment.

To ensure ruggedness, packaged HP300s were subjected to grueling tests. All applicable Federal and Hewlett-Packard packaging standards were exceeded. Tests included four 27-inch corner-wise drops, excessive vibration, and exposure to a wide range of humidity and temperature parameters. Even two sample cross-country shipments were made using the roughest forms of shipment we knew—air freight and trucks. Stress to the HP300s, gauged by accelerometers, was virtually non-existent.

Ready in five minutes

When an HP300 is received, all that is needed to unpack it is a wrench, a screwdriver, and five minutes time. Look at the illustrated international "no text" unpacking instructions, pop off the metal clips holding together the shipping pallet and the cardboard housing, and you're ready to unload.

Open the cardboard cover's front door—no need to worry about low ceilings or low-hanging fixtures—and put the convenient unloading ramp into place. Remove two hold-down clamps and simply roll the HP300 out in "wheelbarrow" fashion.



The best-of-show

Our customers are not the only ones who appreciate the convenience and simplicity of the HP300 packaging. The Society of Packaging and Handling Engineers awarded the HP300 first place in general packaging and proclaimed it best-of-show at their 33rd Annual International Packaging and Handling Design Competition. Their decision was based on originality of design, innovative use of materials, contributions to efficiency in manufacturing, internal plant handling, shipping, and customer ease-of-use.

Check F on the reply card for more information on the HP300 small business system.

Computer Advances is written to inform professionals of the latest technical contributions from Hewlett-Packard. You are invited to receive issues at your place of business or residence. Write Carol Scheifele, Editor, Computer Advances, Hewlett-Packard, 11000 Wolfe Rd., Cupertino CA 95014.

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☐ ☐ B. Overhead transparency/HP2647
☐ ☐ C. System 45B desktop computer
☐ ☐ D. HP250 computer system
☐ ☐ E. HP250 for OEMs
☐ ☐ F. HP300 small business system
☐ ☐ G. Herman Miller "Action Office"

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Some Features Unbundled As Vendor Enhances 'OWL'

ATLANTA — Version 5.0 of the On-Line Without Limits (OWL) program development package from NCI, Inc. includes enhancements to the basic DOS/VS-oriented system, but also sets off as separate-cost options several facilities previously covered in the system price.

Enhancements to the basic OWL include a FILL command that allows columnar updates to be performed on a range of statements; an upgraded LOCATE subcommand which permits the user to specify a columnar range to delimit the locate; implementation of "bookmark" data throughout the edit session; and more comprehensive syntax checking within the primary commands.

The "Search With Replace" feature, along with the "Toggle Switch" and support for a procedure language, were in the system when NCI first introduced them. Now that they have been established and have shown their worth, however they must carry their own price tags, according to a spokesman.

The "Search/Replace" capability allows the user to scan for a specified string of characters within a range of statements and replace that string with another of the same or different length. The replacement string could even be empty, he noted.

The "Toggle Switch" feature allows both split-screen and alternating full-screen access of two pads or listings. One need not be terminated to start the second, NCI reported.

The OWL procedure support permits dynamic insertion of specified operands into a JCL stream at submit time, the spokesman continued.

The basic OWL can now be acquired for $3,500. The Search/Replace option costs $1,000, while the "Toggle Switch" costs $1,250 and the procedure language support costs $1,750, NCI said from 3720 Longview Drive, Atlanta, Ga. 30341.

'RBS-1' Eases DOS JCL

FOUNTAIN VALLEY, Calif. — The RBS-1 utility now available from RBS, Inc. was designed to eliminate virtually all the card handling normally associated with conventional IBM DOS-oriented JCL setup, use and modification.

The package eliminates cards by storing JCL procedures on disk and protects the stored images from unauthorized changes through two levels of password protection. In addition, RBS-1 jobs are logged completely after execution, providing an audit trail and debugging aid, a spokesman claimed.

The two-level protection enables users to make — and presumably test — temporary changes in a previously stored jobstream before altering the master library.

Under RBS-1, a series of program steps can be stored under a single identifier, a facility that allows the operator to later trigger execution of a complete jobstream with a single command. Programs can be executed in any sequence or combination under this utility, the spokesman continued.

The system also enables the operator to add to the stored JCL procedures. The control cards for special work — one-shot extractions from a file or year-end reports, for example — can be entered through the console, he said.

RBS-1 costs $4,000 from RBS, Inc., 10412 Egret Valley, Fountain Valley, Calif. 92708.

Two-Day Course For End Users

PHILADELPHIA — The "often maligned, misunderstood and neglected" end users of DP systems are the people for whom Creative Information Systems, Inc. will present a two-day workshop here in mid-August.

Entitled "Interacting with Structured Systems," the workshop will combine an overview of structured systems development with an intensive introduction to the tools of structured analysis and design.

Because it will view these tools from the end user's perspective, the course fills a gap left by the analyst- or programmer-oriented offerings of other vendors, a Creative Information source said.

The seminar will be held Aug. 13-14 and costs $325, the spokesman said from 13 Concord Way, Chadds Ford, Pa. 19317.

Honeywell Systems To Be Course Topic

WASHINGTON, D.C. — The tools and techniques available to measure and increase productivity on large-scale Honeywell, Inc. systems will be discussed in a course to be held here Aug. 13-17 under the sponsorship of Applied Educational Services (AES).

Gary Richard, developer of the Syrup software monitor, will teach the course. He will use actual examples and detailed case studies to explain how to apply performance tools to identify bottlenecks and get more work out of Honeywell 6000 and Series 60/Level 66 systems.

The registration fee for the course is $595. Further information is available from AES, 4815 Kempair Drive, Woodbridge, Va. 22193.

Performance Price

A special report on Minicomputers & Small Business Systems

With minicomputers getting cheaper and more versatile simultaneously, minis and small business systems are finding new and more sophisticated applications. We'll be looking at the new uses of minis — and the new problems that come along with them — in our August 27th Special Report. We'll provide answers to questions like:

- *How can minicomputers address inflationary problems?*
- *To what extent do existing personnel need to be retrained with the introduction of minicomputers?*
- *How can minicomputers make middle managers more effective in reaching corporate objectives?*
- *How does the introduction of minicomputers compel a need for restructuring data bases?*

Edited by Brad Schultz this Special Report will feature a series of tutorials and application stories explaining how minicomputers and small business systems can best improve your productivity. Simply; getting more from what you've got. With our facts in your hands, you'll be better equipped to do just that — maximize the performance of your minicomputer.

We're going to blaze a trail for the minicomputer and small business system user so don't miss this *Computerworld* Special Report. And if you are a manufacturer or dealer in minicomputer equipment, you'll want your ad there. Closing date is August 10th. Call your *Computerworld* salesman for more information and complete assistance in ad planning. Or, to place an ad, call Frank Collins at (617) 965-5800.

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Now, a security system that opens the door to variable levels of CICS access control.

All of the data stored in your computer needs protection.

But not all of your data needs the same level of protection. Some of it should be readily accessible. Some of it ought to be more difficult to get to. And some of it has to be virtually impossible to get at.

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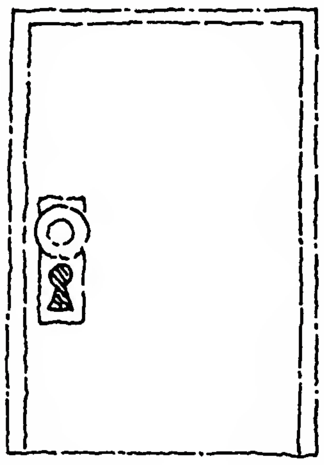

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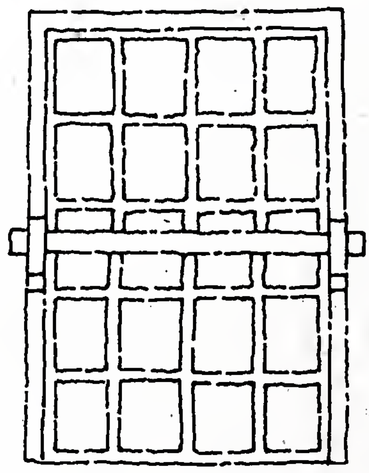

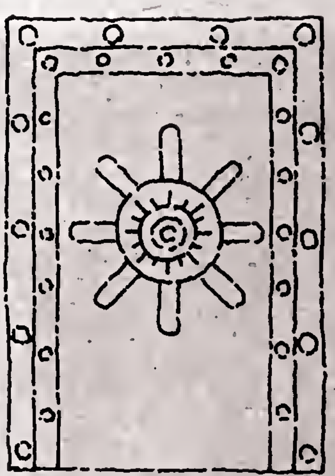

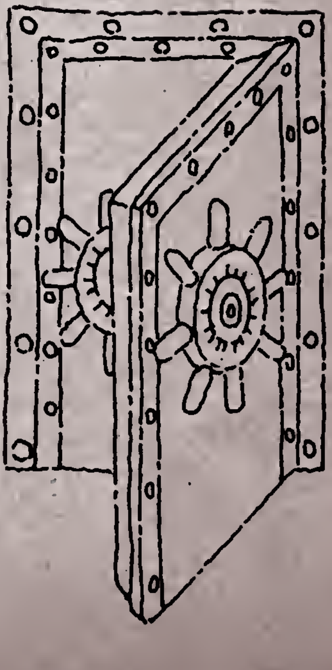

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DOS-OS Transition Aid, Disk Support Updated

DALLAS — University Computing Co. (UCC) has introduced enhanced versions of UCC Two, its DOS- to-OS transition aid, and UCC Three-Adam, a DASD management system.

UCC Two allows most DOS, DOS/-VS or Edos programs to run in an OS/VS environment on IBM 370 or compatible mainframes without reprogramming or any other conversion effort, a spokeswoman noted.

Release 4.3 of UCC Two supports multiple, concatenated libraries as input to the linkage editor function, removal of core dependencies location in the DOS librarian routines supplied with the package, removal of use exit requirements for the UCC Two sort routine and support for program-referencing modules residing in the DOS Shared Virtual Area (SVA), she reported.

UCC Three-Adam was designed to correct free space fragmentation, identify and take controlled action to clean up unused data sets and overallocation of space. This should help conserve DASD resources, according to a spokesman.

Among the enhancements in Version 1.4 of UCC Three-Adam, support for device-independent migration is perhaps the most important, he said. Data sets selected for migration may be directed to tape, DASD or mass storage systems. Space requirements will be recalculated to correspond to the receiving unit

Version 1.4 also provides migration/-backup tape consolidation, nonredundant backup, enhanced selection criteria, allocated data set file, duplicate migration/backup tapes, step retrieval and retrieval tape "pull lists," he added.

UCC Two costs $36,000 or $1,040/mo while UCC Three-Adam costs $11,000. The vendor is in the UCC Tower, Exchange Park, Dallas, Texas 75235.

CICS Net Management Simplified With Package

SPARTA, N.J. — The CICS Network Management Aid (NMA) "dramatically" improves the user's ability to monitor and control CICS operations under any IBM 370 or compatible CPU, according to CS Systems, Inc.

Described as much easier to use than IBM'S CSMT transaction, NMA enables the master terminal operator to respond more quickly to the demands of his network. NMA presents action and status information in pageable displays of up to 100 terminals per screen, a spokesman noted.

Information included in the displays includes terminal ID, terminal status, active or pending transaction ID and operator ID. Another facility — Systems Status Display — allows the user to obtain immediate pictures of transaction activity in his systems.

The System Status Display, which can be manually or automatically initiated, includes data regarding the occurrences of other significant events in the monitoring period, in addition to the actual and projected task rate information, the spokesman said.

NMA provides an interface with the most often required capabilities of CSMT including line, program and data base control functions, he added.

The menu-screen design of NMA results in a significant reduction in the number of keystrokes needed to initiate a request, according to CS Systems. Syntax errors, a frequent occurrence in a keying environment, are virtually eliminated, the company claimed.

NMA is written in assembler and is approximately 16K bytes. The CICS support package will run on any CICS/VS system using Btam, Vtam or ACF/Vtam, the spokesman said.

The package costs $3,150 or $315/mo. CS Systems can be reached through P.O. Box 207, Sparta, N.J. 07871.

Vendor Extends Data Dictionary

LEXINGTON, Mass. — The Datamanager data dictionary from MSP, Inc. can now be interfaced with the System 2000 data base management system (DBMS) from MRI Systems Corp. through an extra-cost selectable unit module from MSP.

The interface extends the basic data dictionary definition language to include System 2000 data bases and repeating groups. It will be extended later to permit the definition of System 2000 schemata against the relevant System, Program and Module entities in the dictionary, a spokesman said.

A second selectable unit, when completed later this year, will permit generation of DBMS entities from definitions held in the dictionary. It will produce Define Command input streams and schemata in Cobol, PL/I or Assembler with optional COMMBLOCK, according to the spokesman.

The first-level definition support module, cataloged as DD9, costs $2,700, MSP said from 21 Worthen Road, Lexington, Mass. 02173.

Meet the World Leader in Data Concentrators

Meet MICOM's Micro800 Data Concentrator, the statistical multiplexor which ended the TDM era. The Micro800 allows up to 16 terminals to share one telephone line more efficiently and more economically than ever before, and provides the added benefit of automatic error correction. And since it is virtually self-configuring, the Micro800 also offers *do-it-yourself installation* — no straps, jumpers, plug-boards or 'kluge' headers to mess with.

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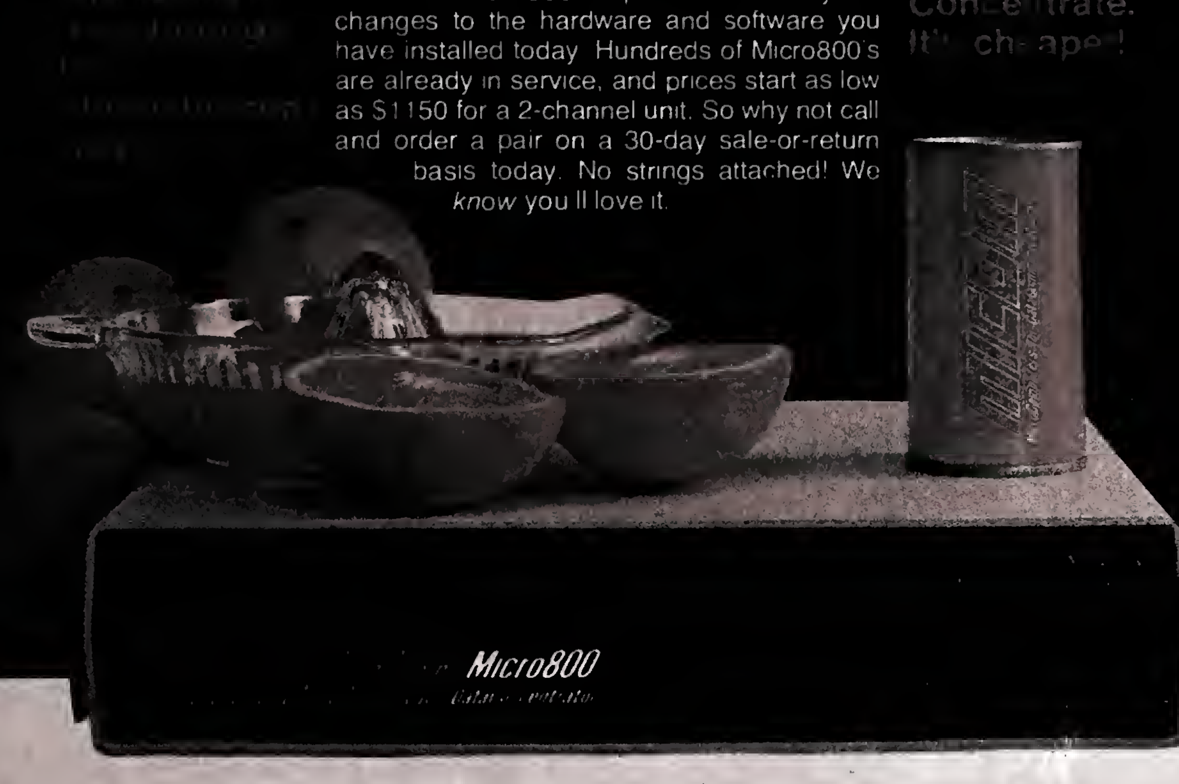

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Flexible, Efficient Operation

RCS Facilities Ease Commercial Paper Control

ST. LOUIS — As the prime lending rate continues to move toward record levels, more and more corporations are turning to the commercial paper market as a valuable source of short-term funds.

Keeping track of commercial paper sales and related data, however, can be a complex and time-consuming task. As a result, many issuers of commerical paper are turning to specialized systems to support these activities efficiently and economically.

In 1976, for instance, the commerical paper department of ITT Financial Corp., headquartered here, switched to an automated system for tracking commerical paper transactions. Even this system, however, did not provide the necessary flexibility and efficiency.

"The system helped us accomplish all the things we had been doing manually, but it did not satisfy all of our needs," according to Norm Appelman, vice-president and director of banking activity.

Comprehensive Tool

"In addition to handling routine commercial paper tasks, we wanted an efficient data base system that would cut storage costs, eliminate data redundancy and provide the information necessary to allow management to monitor commerical paper activity on a timely basis," Appelman explained.

"We wanted a system that would allow cancellations or extensions of notes with minimal data entry; automatic printing of confirmation letters; and automatic issuance of notes at selected issuing locations.

"In short," Appelman continued, "we wanted a comprehensive tool that would reduce our overall efforts to maintain, plan and report on our various commercial paper activities."

In 1978, therefore, ITT Financial began working with Tymshare, Inc. to develop a comprehensive and flexible commercial paper system running on Tymshare's remote computing service network.

"We stopped trying to fit our needs into a fairly limited package, as we had tried to do with the previous commercial paper system," Appelman said. "We wanted to get in on the ground floor of the planning for a system that would not only take care of our many current and planned future needs, but would also accommodate needs that might arise unexpectedly in the future."

After an extensive definition period in which ITT Financial Corp. and Tymshare worked closely together, Tymshare went on to develop the commerical paper system in approximately seven weeks using its Magnum data base language. Parallel testing of the system was completed in March 1978.

Multimillion Dollar Operation

ITT Financial typically has between $400 million and $500 million in outstanding commercial paper notes. It handles about 20 note transactions a day — sometimes as many as 50 a day — and acquires new customers each week.

The company has consolidated assets of over $1.7 billion. Through its consumer and commercial finance subsidiaries, it serves the needs of borrowers through more than 600 offices in 35 states, Puerto Rico and the U.S. Virgin Islands.

The Tymshare system supports ITT Financial's departmental requirements in accounting, sales, marketing and cash management. A relational data base contains files on customers, issuing agents, settlement and payment banks, delivery locations, current notes outstanding, historical notes activity, bank holidays and net short-term debts.

If for any reason a request is made to redeem a note before maturity, the company can easily identify that particular note, make the necessary changes and process the data to reflect accounting requirements.

In the sales and marketing areas, the system not only tells the company which notes are maturing on any particular day — and therefore which customers to call for renewal — but it also generates other information, including, for example, a ranking of customers by number of notes for any period of time.

The system also produces note issuance confirmations, which authorize the bank to pay these notes at maturity. Investment of funds and master note activity are easily tracked, and their impact on commercial paper sales and interest cash is recorded daily.

The system generates reports to support all aspects of the commercial paper business. These daily, weekly and monthly reports include daily sales, sales summaries, net short-term debt summaries, maturities, master notes, bank and customer confirmations, sales analysis and interest and expense accrual.

System in Action

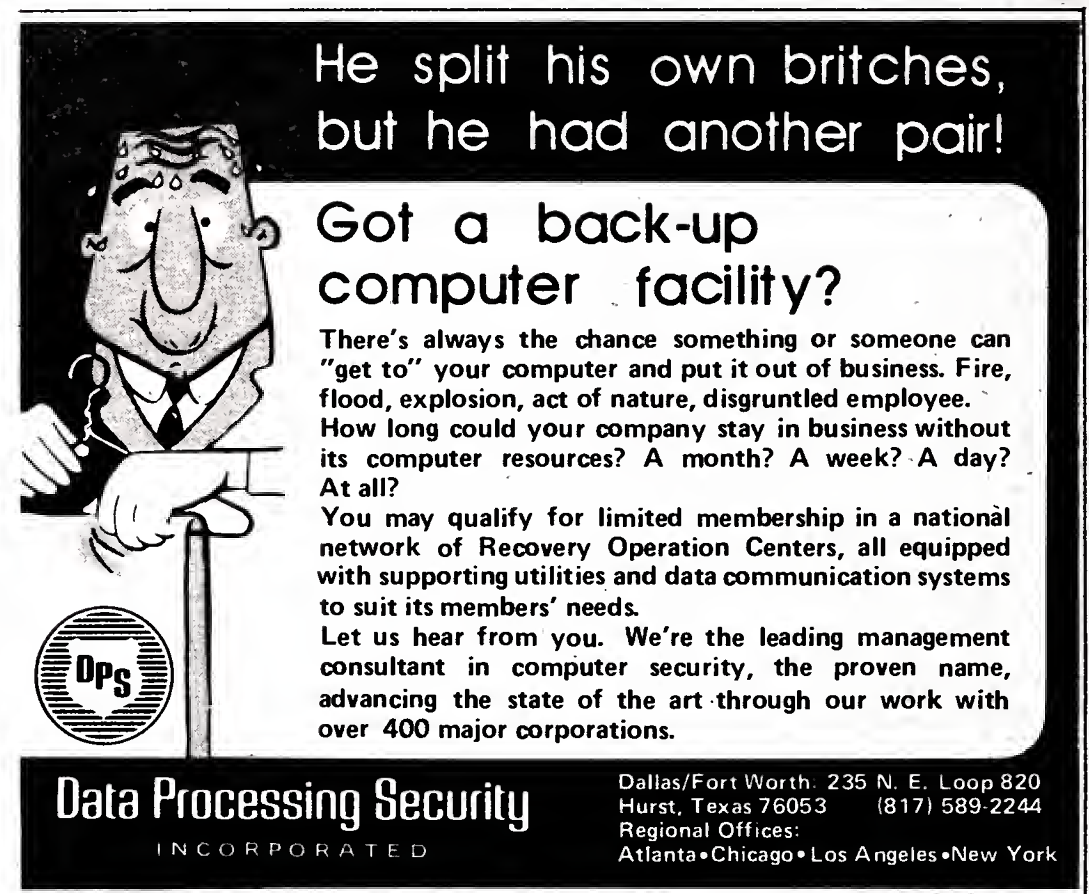
Morning activity begins when the terminal operator keys in a command for the remote computer to print out the reports and confirmations relating to the previous day's business.

During the day, commercial paper orders — with information such as customer name, issue data, maturity, term days, rate and net proceeds — are taken over the telephone and recorded on a special form. This data is then entered into the computer through the terminal.

"Inputting data is extremely easy," assistant treasurer Goldie Satz said. "All the data is keyed into a single free-form line with fields that designate the information characteristic of that customer.

"All error and descriptive messages printed by the computer are easily understood. And all files can be updated interactively for immediate use or can be defined with only one command.

"Moreover," Satz added, "Magnum makes it easy to get whatever information we need by using simple English-Language statements. Because all the data related to a specific customer is organized around key fields, we can inquire into the data base and get the information in any form we desire."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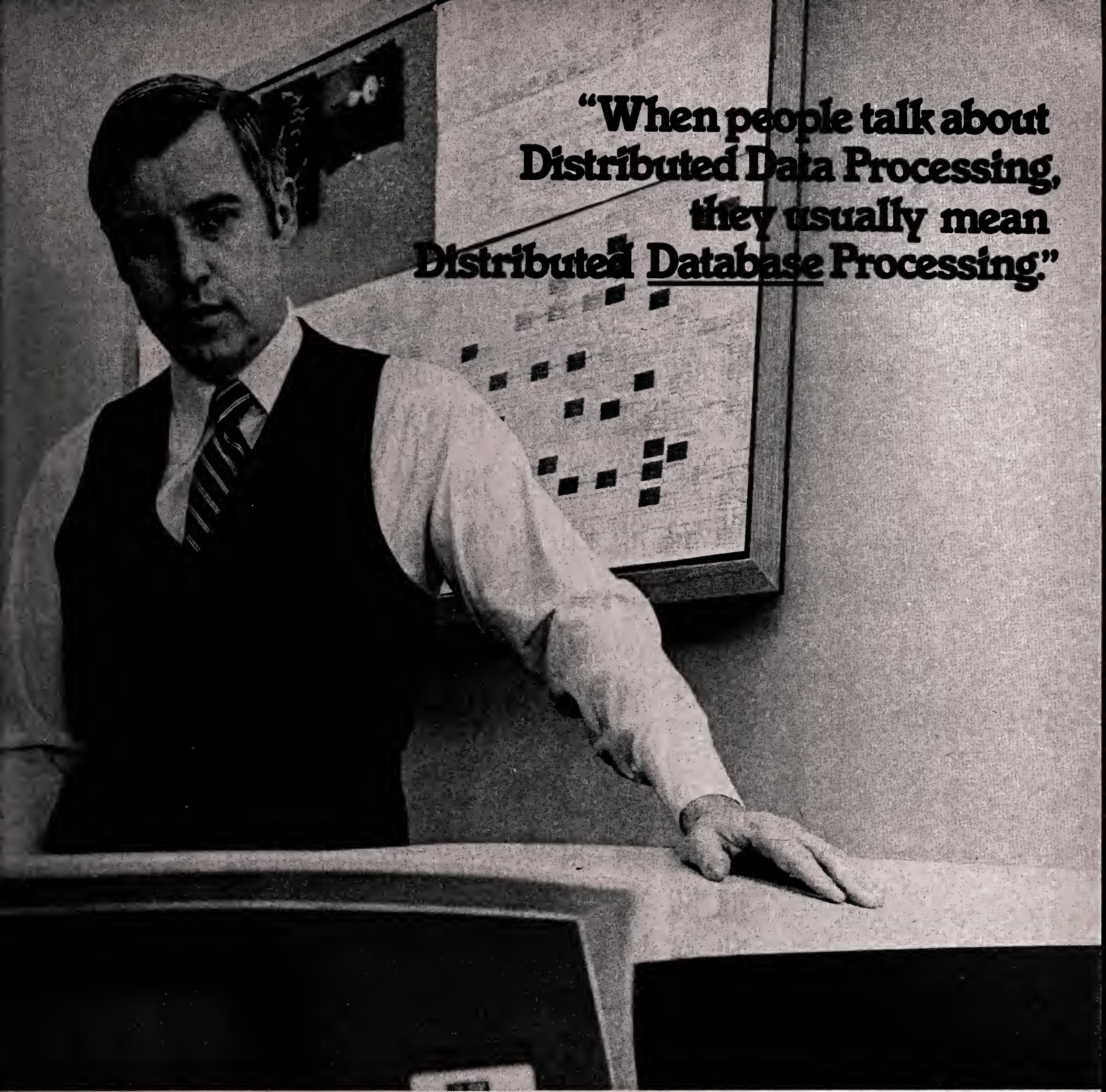
Quarterly Urges 'Graphics Plan'

CHICAGO — The Spring 1979 issue of *Sandra Pakin & Associates Folio* newsletter focuses heavily on "the graphics plan" in preparing user guides to DP systems.

Graphics planning is the definition and structuring of any document's visual presentation, which can often spell the difference between a manual that is merely a good job technically and one that is also usable and used, according to *Folio* editor Deanna Bethke.

The quarterly discusses how graphics improve readability and provides suggestions for learning to "think graphically," she said.

Requests for a free index to the past eight issues of *Folio* and orders for subscriptions to the newsletter — $25/year; $30/year outside North America — should be addressed to Sandra Pakin & Associates, 6007 N. Sheridan Road, Chicago, Ill. 60660.


"When people talk about
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they usually mean
Distributed Database Processing."

What's attractive about distributed database is that it makes data available at the local level where it is needed but still allows control of the data from a central site.

With the availability of low-cost, high-performance hardware like the IBM 4300, more and more organizations are including distributed database networks in their future plans.

That future is here *today* with Cullinane Corporation. Cullinane pioneered in distributed database technology when we designed and implemented a prototype back-end database system for four government agencies. What we learned from this project about the unique requirements of distributed database technology led directly to the architecture of Release 5.0 of IDMS, IDMS-DC, our new powerful teleprocessing monitor, and Multiple Computer Support (MCS), a system that allows multiple IBM-compatible CPUs to share databases.

These three products – IDMS 5.0, IDMS-DC and MCS – allow applications programs to reside at remote sites and to update a central control database with user transparency and database integrity. Distributed database systems allow upper management to consolidate information from remote databases into a central database. This is possible through the separation of the application program from the DBMS – a capability which is unique to IDMS and essential to the implementation of distributed database systems.

Distributed database is only one example of Cullinane leadership in the development of management software designed to protect today's investment while providing tools for the future. For example, we will be offering an interface which will allow IDMS to support DL/1 applications. Another new product, the Automatic Applications Development System (AADS), will enable users to develop applications rapidly by defining a few simple parameters as opposed to performing complex coding tasks.

Before you make a database decision affecting your ability to manage your organization tomorrow, look at Cullinane today.

Write or call for more information on our special management briefing session or on our advanced database software products.

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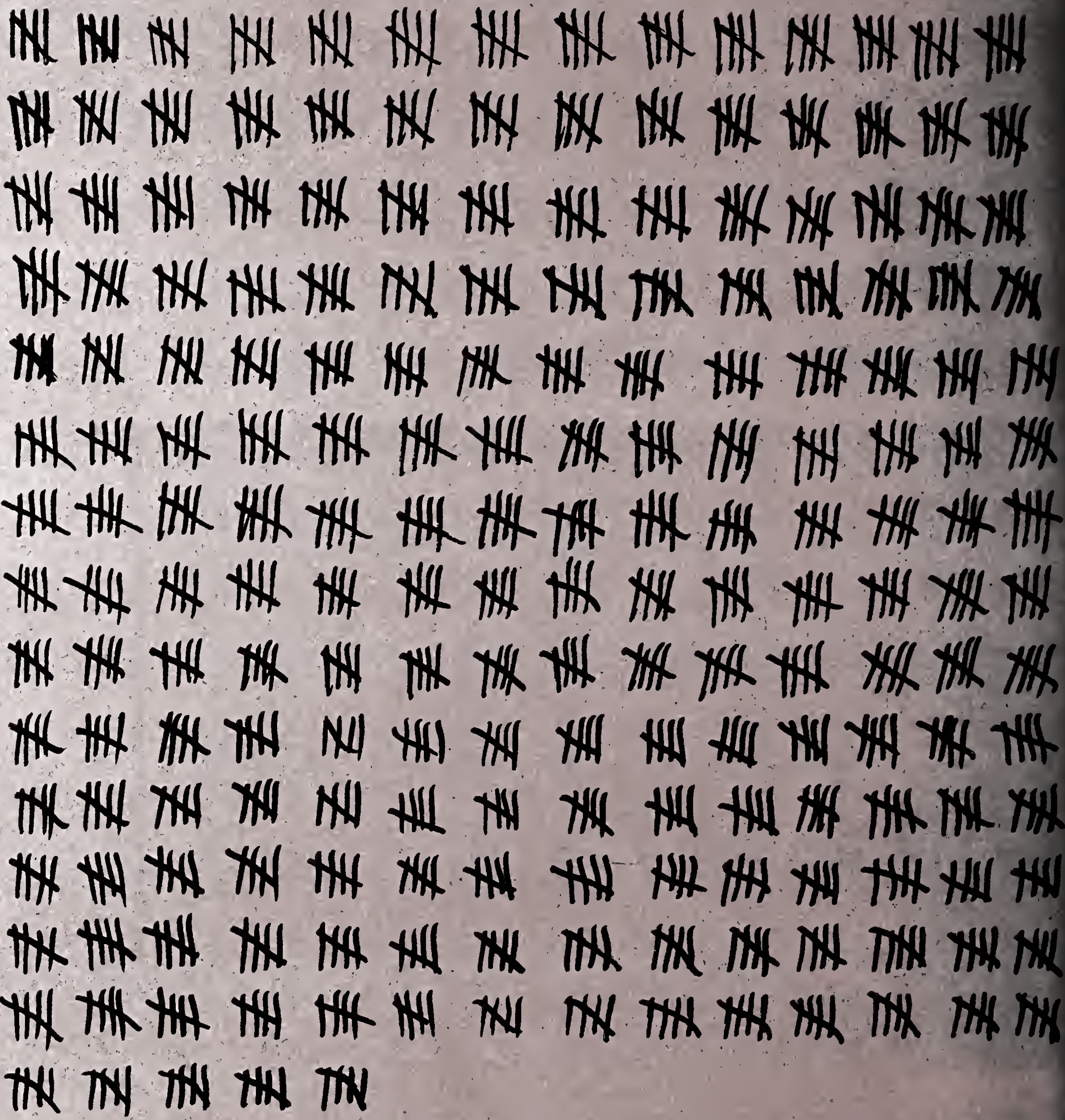

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Many Savings Seen With On-Line Library Use

MADISON, Wis. — "The lowest priced on-line librarian on the market" has reduced programming maintenance by two-thirds, reduced disk storage by 50% and made a marked savings in paper costs for National Guardian Life Insurance Co. here, according to the company's DP manager, James M. Hartman.

Marian: The On-Line Librarian, developed and marketed by Computer Software Unlimited (CSU) of Memphis, was installed by Hartman and his staff after a thorough evaluation of available on-line librarian systems.

Needing to consolidate four different tape library systems maintaining some 900 programs, Hartman began searching for an on-line librarian compatible with his IBM 370/135, DOS/VS and Power VS configuration. By eliminating all systems that would not support his teleprocessing monitor (the Display Unit Control System [Ducs] from CFS, Inc.), Hartman was left with a choice between Marian, which supports any teleprocessing monitor, and one other system.

After ordering both systems on a free trial basis, "I was first impressed by Marian's smaller, more readable manual," Hartman said.

"I thoroughly read the other vendor's manuals, but afterwards still couldn't do anything with the system. After reading Marian's manual, however, I was able to install it."

In outlining the requirements he was looking for in an on-line librarian system, Hartman established a list of 14 selection criteria which were submitted to the prospective vendors. "CSU's president, Mike Pfaff, responded to each point individually, rather than just answering with a blanket statement as the other vendor did, and that impressed me," Hartman recalled.

Once both systems had been tested at National Guardian's DP site, Hartman and his staff had no difficulty making a decision. In fact, "my people got so enamored of Marian and kept slapping more and more programs into it that I had to take it. I could never have backed out of it."

Simplicity Lauded

Now that Marian has been up and running for nearly six months, "there's no doubt in my mind that its most important advantage is its simplicity.

"Training time took no more than 30 minutes; Marian's approach to making changes eliminates the problem of learning multiple screens, and the traffic of programmers in the computer room has been eliminated," Hartman said.

That has a real impact on morale, according to Hartman: "My programmers feel more in control of their own destiny. Using Marian, they no longer need to worry about impacting background to do their testing."

The DP manager is also pleased with the system's time- and money-saving features: "Our programming maintenance has been reduced to one-third of what it was before the change. Keypunching, batching, compiling, testing and debugging frequently took two to three days. Now we can compile in a matter of minutes.

"Also, Marian's interface through the spooler queue allows programmers to look at output without printing compiles, so they can save two to three compilation printouts per day. And with paper prices going up, that adds up to a significant savings."

Disk storage space has been cut in half because of the system's library compression techniques, according to Hartman. The programming staff has also gained a half-day of maintenance time per week, since the company's half-day Friday schedule previously allowed time only for production. With Marian allowing maintenance at any time, Friday mornings have been freed for his people.

Other features of the CSU software which have impressed Hartman are its "as of" date function, audit trail, documentation feature and speed of operation.

The "as of" date feature, which allows a member to be displayed, compiled or reproduced as it existed at any previous point in time, has been "very handy," Hartman said, when two people are working on the same program and it becomes necessary to back up to correct conflicting changes.

Marian's audit trail, which allows quick correction of erroneous program changes, has even been used by the company's external auditors to verify information, and the documentation feature enables easy updating of system documentation, he added.

"Marian's a fast system, too. It runs very quickly to pick up our entire library. We have about 250,000 statements, and Marian takes about eight minutes," he noted.

Faster Maintenance

Even user departments at National Guardian have benefited from Marian, according to Hartman. Critical maintenance problems that were previously delayed by a long job being run can now be checked and corrected in one day.

The package is currently being used for systems-type work by Hartman's staff as well as source maintenance for the department's 14 on-line systems. Hartman has plans to develop additional on-line systems utilizing Marian.

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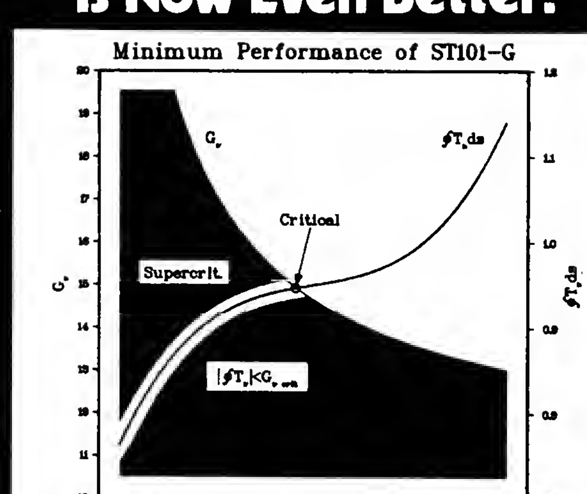

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Data Base Design Seminar Topic

NEW YORK — The five-day "Generalized Data Base Modeling Design Workshop," to be presented here by Yourdon, Inc. the week of July 30, will cover logical and physical data base technical concepts, information modeling and data base design.

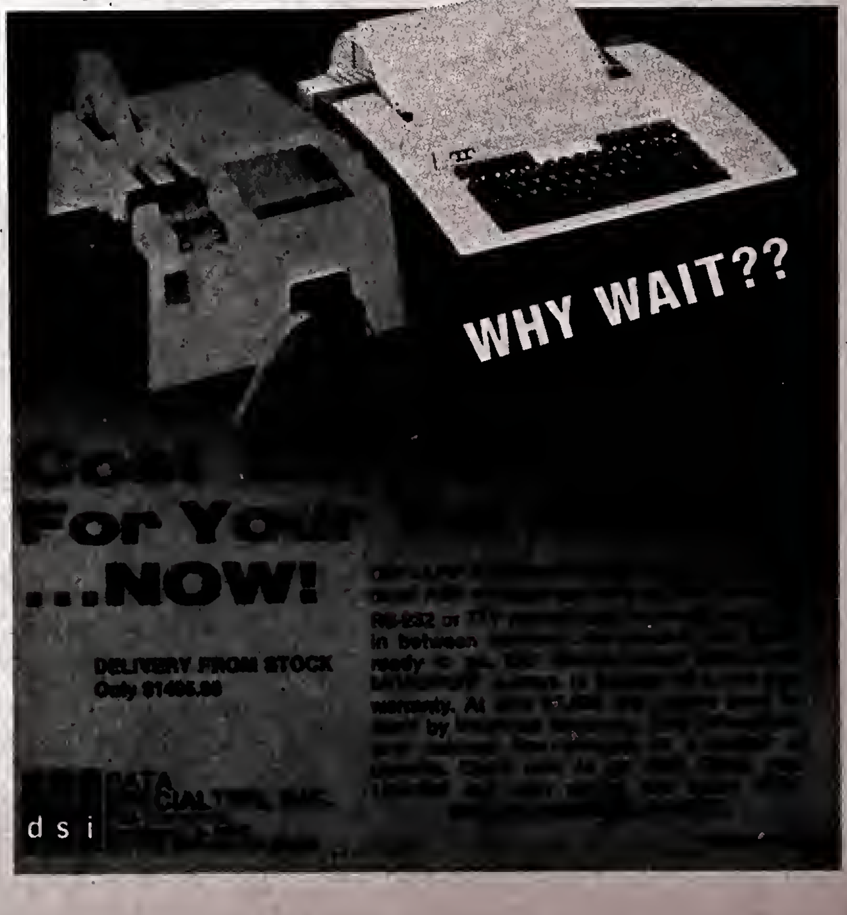
Intended for technically oriented people familiar with at least one data base management system, the course also requires familiarity with the principles and techniques of structured analysis, a spokeswoman said.

Each student will receive a copy of *Computer Database Organization* by James Martin, along with copies of the instructor's visuals, she noted.

The logical concepts to be considered include definitions of data base and data base systems; relational, hierarchical and network approaches; and modeling the domain of information. Physical considerations include access methods; single- and multiple-record access techniques; indexing and hashing; and overflow handling.

The analysis portion of the course will discuss both data content and user requirements, including the decomposition of user views and data flows, tools of structured analysis, analysis of usage patterns and quantification of operational and hardware requirements.

The registration fee for the course, including Martin's book and other materials, continental breakfasts and lunches, is $800, Yourdon reported from 1133 Ave. of the Americas, New York, N.Y. 10036.



Data Briefs

LSD Subdivides Lines, Ties to 370X Front End

LARGO, Fla. — A line-sharing device (LSD) able to subdivide IBM users' 38.4K bit/sec communications lines into multiple 9,600 bit/sec lines is available from Paradyne Corp.

The LSD 384 Smart Inverse Multiplexer can be connected to IBM 370X front-end control units or to local control units (LCU) in Paradyne's Pixnet communications systems. Like an earlier Paradyne LSD model, the 384 compensates for absolute delays of up to 800 msec, a spokesman said.

Components include a microcomputer, channel interfaces, modem interfaces and integral Paradyne LSI-96 9,600 bit/sec modems. Each channel interface reportedly can handle two modem interfaces.

The field-expandable LSD 384 costs $26,000. Paradyne is at 8550 Ulmerton Road, Largo, Florida 33541.

Timeplex Adds Multiplexers

HACKENSACK, N.J. — Timeplex, Inc. has expanded its line of statistical multiplexers and data concentrators.

The Series II consists of five models that support eight synchronous or asynchronous channels on one 19.2K bit/sec full-duplex line or two 9,600 full-duplex lines.

The Series III, meanwhile, provides a 48K-byte buffer memory and supports up to 24 channels with an eight-to-one compaction rate, a Timeplex spokesman said. Like the Series II, the top-of-the-line system supports the X.25 Level II data link protocol.

A 24-channel Series III with chassis/-motherboard and power supply costs about $9,000, compared with $3,350 for an eight-channel Series II. Timeplex is at 100 Commerce Way, Hackensack, N.J. 07601.

CIMC Lets User Switch Connection

WILTON, Conn. — The Communications Intelligent Matrix Control (CIMC) unit from T-Bar, Inc. reportedly allows users to switch connections between data lines, modems, multiplexers, concentrators and front-end processors anywhere in a distributed data communications network.

With a dual 8-in. floppy disk unit and the capability to interface up to four matrices, the CIMC costs $50,000. With a redundant microprocessor and the capacity to support up to 22 ports, the product costs "several hundred thousand dollars," the source said.

T-Bar is at 141 Danbury Road, Wilton, Conn. 06897.

Survey of 307 Users

Teleprinters Liked: Datapro

By Brad Schultz
CW Staff

DELRAN, N.J. — Communications users showed strong approval of their teleprinter terminals in a recent Datapro Research Corp. poll.

Computer Devices, Inc. and Digital Equipment Corp. terminals won the highest marks in the survey of 307 users, but Anderson-Jacobson, Inc., Trendata Corp. and Xerox Corp. were not far behind.

In fact, the average ratings for all vendors collectively, for each criterion considered, were at least "good" under the usual Datapro scheme of points, where 4 = "excellent," 3 = "good," 2 = "fair" and 1 = "poor."

Texas Instruments, Inc. was also conspicuous — given the number and variety of its terminals in current use. The Lone Star vendor pulled ratings from 3.0 to 3.5 in overall performance for all seven of the product groupings Datapro arbitrarily defined.

Only one vendor came a cropper: Western Union, especially in the area of maintenance. Sixteen users of 3,072 Western Union terminals gave the firm marks well below its competition in every category — although the Teletype Corp. Model 33s that Western Union uses internally fared a little better than other Western Union terminals and at roughly the same level as 33s directly from Teletype.

The average marks for maintenance and print quality suggest that several vendors have more to worry about in those areas than in other areas. On the other hand, Xerox can be proud of a perfect score from five users in maintenance for 25 members of its 1700 series. (But then, how much maintenance was rendered given a nearly perfect score in hardware reliability?)

Datapro noted in "All About Teleprinter Terminals," the $12 report that contains these survey results, that "some of the models were rated by only a few users, and the results in these cases are presented solely for information purposes; it would be unwise to draw firm conclusions about these models from the small samples represented."

A summary of the results from Datapro's terminal user survey follows on Page 77.

That caveat may take some luster from the Xerox results and it surely raises questions about the tallies for the world's largest manufacturer of computer equipment. Only 19 IBM customers answered Datapro's poll, representing 192 terminals — nearly all of them 2740s, 2741s and 3767s — out of the 14,775 used by all 307 respondents. This hardly accounts for IBM's significant penetration of the terminal market.

A sparse turnout from Computer Devices customers (only eight responded) likewise detracts from the vendor's distinction as

(Continued on Page 77)

Gimmick-Free Budget Cut Found Best

By Perry J. Davis
Special to CW

In late 1975, the management of Church & Dwight Co., makers of Arm & Hammer brand products, planned and approved a data communications budget of $80,000 for 1976 based on several years' historical trends. Actual cost for 1976 was only $58,500, dropping to $26,700 in 1977 and to $16,600 in 1978.

Sales remained relatively constant during this time at about $100 million. Why the dramatic reduction in data communications costs?

A simple explanation is the direct attention management applied to the cost of all forms of communications throughout the company. Rather than accepting creeping escalations in expenses with haphazard controls, management asked for and studied total company communications needs.

With the help of a communications professional, a comprehensive plan was then developed. Changes were implemented in an orderly manner, with regular progress reviews and total support from top management.

A professional communications consultant helped immensely. The consultant focused attention on changes appropriate to the business, changes that could quickly produce out-of-pocket savings, as well as provide long-term expense control within an acceptable level of communications service.

On assignment from the senior vice-president of Corporate Services, a study of the entire communications network within the

(Continued on Page 83)

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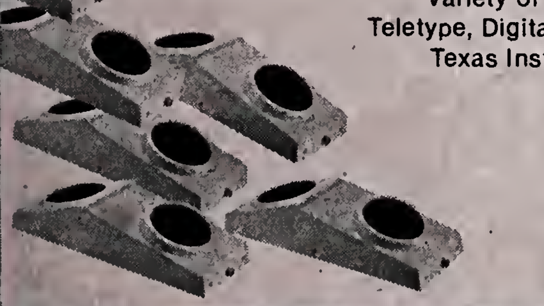

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Citibank Decrypts Security Policy

Computerworld has received some points of clarification relating to "Nets Seen Easy Prey for Wiretappers," an account of the recent National Computer Conference technical session on network security [CW, June 25], from Citibank cryptography expert M. Blake Greenlee.

Though in the forefront of civilian applications of data encryption, Citibank is only just now implementing the encryption methods, described in the article, whereby the encryption keys used in safeguarding electronic funds transfers (EFT) are themselves encrypted. These keys are not necessarily changed daily, as the article implied, but they can be.

Moreover, unlike Interbank's representative at the session, Greenlee has some reservations about encrypting all EFT personal identification numbers to discourage fraud attempts.

Concerning Citibank's overseas network security, Greenlee made the following statement:

"A multinational company operating in a foreign country is a guest of that country and must obey local laws [and] local regulations.

"As corporate citizens, we are welcome only as long as we operate openly and our operations are an asset to the host country. As in the U.S., a bank must be open with the local examiners or government representatives.

"Major banks, however, frequently handle transactions for the local government as well as corporate and individual clients — including the government — must be accorded privacy and confidentiality.

"Where the risk to the bank or client that might result from the interception of telecommunications traffic warrants it, line encryption must receive serius consideration. Encryption is not a panacea, but does provide excellent protection for that data.

"The privacy of the local government and its citizens is then protected from either industrial espionage or the wiretapping activities of other governments."

Finally, Motorola Corp.'s Government Electronics Division is only one of the firms that supplied Citibank's encryption gear.

New device cuts phone costs by concentrating data for more effective transmission.

The new microprocessor-based Prentice SNP-1000 Statistical Network Processor takes data from as many as eight different sources, buffers it, and transmits it at speeds up to 9600 bps in variable-length blocks according to each individual channel's immediate needs. And it does all this with virtually error-free accuracy.

By combining an intelligent concentrator with a statistical time division multiplexer, the new SNP-1000 transmits more data over fewer circuits.
Traditional frequency and time division multiplexing schemes allot data channels to specific and discrete portions of the transmission circuit. The new Prentice SNP-1000 mixes signals according to their individual and often rapidly changing needs. A slow-speed source gets only a small portion of available transmission time. A busy circuit gains access to larger portions of the data link. Thus idle terminals don't take up transmission capacity better used by active data sources.

This "intelligent" TDM technique lets you transmit your current data volume over slower speed lines. Or lets you increase your data flow over high-speed facilities. Either way it represents a practical way for a network designer to increase data traffic flow and economize on telephone line expenses.

The SNP-1000 operates in point-to-point or in multi-point networks.
An SNP-1000 8-channel unit can be configured to connect to, and internally poll, up to 8 separate multi-point SNP units. This allows an asynchronous network to use the SNP-1000's synchronous protocol for error correction and polling operation without an expensive polling front end processor or intelligent terminals at remote sites. The SNP-1000 accepts mixed input data speeds within the same system, be it leased line or dial-up.

Available documentation and software lets the computer multiplex and demultiplex data on the high-speed line, reducing the number of computer ports dedicated to the communications system. It also eliminates the need for an SNP-1000 at the computer end of the line.

Plug it right into your system. It's completely transparent to terminals, CPUs and software.
You can put the SNP-1000 to work without changing a thing in your existing system. Data flowing in and out of the unit is not affected in any way except that it is transmitted with much greater efficiency.

Automatic data checking guarantees virtually error-free transmission.
Using sophisticated error-checking routines, the SNP-1000 continuously monitors data transmissions to ensure that valuable information is not lost because of transmission line irregularities.

Diagnostics give you instant information on your operating parameters.
Front panel, At-A-Glance™ diagnostics come standard with the SNP-1000. These ten indicator lights inform users that a retransmit request (ARQ) is being sent to their remote station, that a local channel loopback is in effect, that an error has been detected in received data, that a data buffer is 80% full, that buffer capacity has been exceeded, that a remote unit is not functioning, and more.

An optional diagnostic and control port, available on 4 or 8 channel units, lets the SNP-1000 user reset the system; display channel input/output data; display channel status, aggregate status, system options, or system statistics (local or remote); alter channel or aggregate options (local or remote); and run diagnostic tests.

The SNP-1000 uses downline loading to alter remote unit operating parameters from a central location. Simply set a few switches, or key entries in through a keyboard with the diagnostic and control port. New parameters are automatically downloaded to remote, unattended locations.

Prentice has a brochure and an application note with more information on features, specifications and network design.
For your free copies, write Prentice, 795 San Antonio Road, Palo Alto, California 94303, or call (415) 494-7225.

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Data Briefs

CRT Terminal Stores Whole Pages

MINNEAPOLIS, Minn. — The ability to store and retrieve whole pages reportedly highlights a multipage CRT terminal that its manufacturer, the Teleray Division of Research, Inc., intends for editing and formatting.

Occupying 8- by 12 in. of desk space, the Model 12 stores up to 48 80-character lines in each of its 32 functions and provides a 24-line display that users can scroll up and down.

Teleray also introduced a synchronous/asynchronous terminal controller that replaces its IBM 3271 counterpart and supports up to eight IBM 3277-type units, a company spokesman said. The controller, which links bisynchronously to a mainframe and asynchronously to CRT terminals, costs $3,500 to $4,500, depending on its features.

The Model 12, meanwhile, costs "about" $1,590, he said.

The Teleray Division of Research, Inc. is at Box 24064, Minneapolis, Minn. 55424.

Modem Optimizes Transfer of Data

SUNNYVALE, Calif. — Tek-Com, Inc.'s TC3001 modem was designed to optimize the transfer of low-speed data over normal voice grade telephone lines using an ordinary telephone handler.

The unit, compatible with Bell's 103 and 113 sets, offers 300 bit/sec asynchronous transmission in half- and full-duplex modes. The originate-only modem includes RS-232 and 20mA current loop interfaces and power and carrier indicators.

Weighing less than four lbs, the TC3001 costs $265. Discounts are available for large quantity orders.

Tek-Com is at 1147 Sonora Court, Sunnyvale, Calif. 94086.

Prices Cut on Teleprinters

BURLINGTON, Mass. — Computer Devices, Inc. has lowered prices on refurbished model 1030 and 1132 Teleterm portable teleprinters.

Retooled 1030s will sell for $1,085 or lease for $65/mo on a one-year contract, the vendor said. The model 1132 now goes for $1,985 or leases for $100/mo on a one-year contract.

Both models reportedly print a 96-char. Ascii set in upper and lower case at speeds of up to 30 char./sec. The 1030 and 1132 print 80- and 132-col lines, respectively.

Teleterms are predecessors of Computer Devices' Miniterms, ranging from desktop terminals to portable computer systems. The vendor is at 25 North Ave., Burlington, Mass. 01803.

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Teleprinter Terminals Popular, Datapro Finds

(Continued from Page 75)

maker of the hottest performing terminals in Datapro's study. Computer Devices' overall average in performance (3.8) was matched by Anderson-Jacobson's 830 series and DEC's LS 120 Decwriter III; while other products by the latter two vendors rated closer to the mainstream of their competition.

Terminal Characteristics

Datapro asked the users to describe the characteristics of their teleprinter terminals. About 55% said their equipment was keyboard send receive (KSR); 27% checked automatic send receive (ASR); and 8% indicated receive-only (RO).

About two-thirds of the users operate in half-duplex mode, while the rest run in full-duplex, Datapro found. Almost 90% employ character rather than block transmission; 80% transmit at printing speed; and more than half the users transmit in Ascii code.

The most widely used type of transmission facility is direct distance dialing (dial-up), but nearly a quarter of the respondents engage private telephone lines.

Some Ugrades

Do the users plan to replace their existing teleprinter equipment in the near future?

More than half replied negatively to this question, but 14% do intend to upgrade to another teleprinter while 7% expect an upgrade to a CRT display device.

The report, including survey results and charts contrasting the features and prices of 124 teleprinters from 54 vendors is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

USERS' RATINGS OF TELEPRINTER TERMINALS

Terminal Supplier and Model	No. of User Responses	No. of Terminals in Use	Weighted Averages and Response Counts																													
			Overall Performance					Ease of Operation					Keyboard Feel and Usability					Print Quality					Hardware Reliability					Maintenance Service				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Anderson Jacobson																																
830 Series	12	26	3.8	9	3	0	0	3.8	9	3	0	0	3.8	10	2	0	0	3.4	6	5	1	0	3.6	7	5	0	0	3.5	7	4	1	0
Other models & unspecified	7	31	2.9	2	3	1	1	3.3	2	5	0	0	3.0	1	5	1	0	2.9	0	6	1	0	2.7	0	5	2	0	3.1	4	1	1	1
Subtotals	19	57	3.4	11	6	1	1	3.6	11	8	0	0	3.5	11	7	1	0	3.2	6	11	2	0	3.3	7	10	2	0	3.4	11	5	2	1
Computer Devices																																
Miniterm 1203	5	74	3.8	3	2	0	0	3.6	3	2	0	0	3.4	2	3	0	0	2.4	0	3	1	1	3.0	1	3	1	0	3.2	2	2	1	0
Other models & unspecified	3	12	4.0	3	0	0	0	3.7	2	1	0	0	3.7	2	1	0	0	3.0	1	1	1	0	3.0	1	1	1	0	3.0	0	3	0	0
Subtotals	8	86	3.8	6	2	0	0	3.6	5	3	0	0	3.5	4	4	0	0	2.6	1	4	2	1	3.0	2	4	2	0	3.1	2	5	1	0
Computer Transceiver Systems, all models	6	47	3.3	2	4	0	0	3.5	3	3	0	0	3.5	3	3	0	0	2.5	0	4	1	1	3.2	2	2	1	0	2.8	1	3	0	1
Diablo 1620	3	6	3.0	1	1	1	0	3.0	1	1	1	0	3.0	1	1	1	0	3.7	2	1	0	0	2.7	1	1	0	1	2.7	0	2	1	0
Digital Equipment Corp																																
LA 36 DECwriter II	50	472	3.4	22	25	3	0	3.2	15	29	4	1	3.2	18	25	3	3	2.9	7	30	11	1	3.5	27	17	3	1	3.1	18	18	7	3
LS 120 DECwriter III	16	67	3.8	12	4	0	0	3.8	9	7	0	0	3.5	8	8	0	0	2.7	4	9	3	0	3.4	6	10	0	0	3.2	5	9	2	0
Other models and unspecified	5	99	3.4	2	3	0	0	3.4	2	3	0	0	3.8	3	1	0	0	2.6	1	3	0	1	3.2	2	2	1	0	3.2	1	4	0	0
Subtotals	71	638	3.5	36	32	3	0	3.3	26	39	4	1	3.3	29	34	3	3	2.9	12	42	14	2	3.4	35	29	4	1	3.1	24	31	9	3
General Electric																																
TermiNet 30	7	1 126	3.0	1	5	1	0	2.6	1	3	2	1	3.0	1	4	1	0	3.6	4	3	0	0	3.1	1	6	0	0	2.9	0	6	1	0
TermiNet 200 Series	4	10	3.0	0	4	0	0	2.3	0	1	3	0	3.0	0	3	0	0	3.3	1	3	0	0	2.5	0	3	0	1	2.7	0	2	1	0
TermiNet 300 Series	6	140	3.3	2	4	0	0	3.3	2	4	0	0	3.4	2	3	0	0	3.5	3	3	0	0	3.3	2	4	0	0	3.2	2	2	1	0
TermiNet 1200 Series	7	21	3.0	1	5	1	0	2.7	0	5	0	1	3.0	0	5	0	0	3.0	1	5	1	0	3.4	3	4	0	0	3.0	3	1	3	0
TermiNet, unspecified	5	32	2.8	0	3	1	0	2.5	0	3	0	1	2.5	0	3	0	1	2.5	0	2	2	0	2.5	0	3	0	1	2.0	0	1	1	1
Subtotals	29	1 329	3.0	4	21	3	0	2.7	3	16	5	3	3.0	3	18	1	1	3.2	9	16	3	0	3.1	6	20	0	2	2.8	5	12	7	1
Harris, all models	4	69	3.3	3	0	0	1	3.3	2	1	1	0	3.7	2	1	0	0	3.5	3	0	1	0	3.3	3	0	0	1	3.3	3	0	0	1
IBM																																
2740 2741	10	101	3.1	3	6	0	1	2.9	1	7	0	1	3.2	1	8	0	0	3.2	3	6	1	0	3.1	2	7	1	0	3.3	3	7	0	0
3767	6	85	2.8	0	5	1	0	3.3	1	2	2	1	3.0	1	4	1	0	3.0	0	6	0	0	2.5	0	4	1	1	2.5	1	5	0	0
Other models	3	6	3.0	1	1	1	0	3.3	1	2	0	0	3.3	1	2	0	0	3.7	2	1	0	0	3.7	2	1	0	0	4.0	3	0	0	0
Subtotals	19	192	3.0	4	12	2	1	2.8	3	11	2	2	3.1	3	14	1	0	3.2	5	13	1	0	3.0	4	12	2	1	3.4	7	12	0	0
Teletype																																
ASR 33	10	24	2.9	2	6	1	1	2.7	3	1	6	0	2.4	1	3	5	1	2.7	1	7	0	2	3.0	2	7	0	1	3.2	3	6	1	0
KSR 33	5	51	2.8	1	3	0	1	2.6	0	3	2	0	2.4	0	3	1	1	2.4	0	3	1	1	3.2	3	1	0	1	3.2	2	2	1	0
Model 43	18	578	3.7	12	6	0	0	3.4	9	7	2	0	3.3	7	10	1	0	3.2	5	11	2	0	3.7	13	5	0	0	3.5	8	3	2	0
Other models	7	3 512	3.0	1	4	1	0	3.2	2	3	1	0	3.0	1	2	1	0	3.3	2	4	0	0	3.5	3	3	0	0	2.8	0	5	1	0
Subtotals	40	4 165	3.3	16	19	2	2	3.1	14	14	11	0	2.9	9	18	8	2	3.0	8	25	3	3	3.4	21	16	0	2	3.2	13	16	5	0
Telex, all models	4	765	3.3	1	3	0	0	3.3	1	3	0	0	3.3	1	3	0	0	3.3	1	3	0	0	3.3	1	3	0	0	2.3	0	1	3	0
Texas Instruments																																
733	6	296	3.5	3	3	0	0	3.2	1	5	0	0	3.5	3	3	0	0	2.7	0	4	2	0	3.3	3	2	1	0	2.8	0	3	1	0
735	4	33	3.3	1	3	0	0	3.5	2	2	0	0	3.3	1	3	0	0	2.5	0	2	2	0	3.3	2	1	1	0	3.0	0	4	0	0
743	4	505	3.0	0	4	0	0	3.3	1	3	0	0	2.8	0	3	1	0	2.8	0	3	1	0	2.8	1	2	0	1	2.5	0	2	2	0
745	18	122	3.4	10	6	2	0	3.6	11	6	1	0	3.2	7	8	3	0	2.8	5	4	9	0	3.3	10	4	4	0	3.3	8	6	3	0
Other 700 Series models	8	2 565	3.1	2	5	1	0	2.6	2	2	3	1	3.1	3	3	2	0	2.8	1	4	3	0	3.1	3	3	2	0	2.8	1	3	2	0
810	5	339	3.2	2	2	1	0	3.4	2	3	0	0	—	0	0	0	0	3.6	4	0	1	0	3.4	2	3	0	0	2.8	0	3	1	0
All other models	3	3	3.3	1	2	0	0	3.7	2	1	0	0	3.7	2	1	0	0	3.0	1	1	1	0	3.0	1	1	1	0	3.0	1	1	1	0
Subtotals	48	3,863	3.3	19	25	4	0	3.3	21	22	4	1	3.2	16	21	6	0	2.8	11	18	19	0	3.2	22	16	9	1	3.0	10	22	10	0
Trendata																																
4000 Series	6	68	3.7	4	2	0	0	3.5	4	1	1	0	3.3	4	1	0	1	3.8	5	1	0	0	3.7	4	2	0	0	3.3	2	4	0	0
Trendwriter	3	3	3.0	1	1	1	0	3.7	2	1	0	0	3.7	2	1	0	0	3.3	1	2	0	0	3.3	1	2	0	0	3.3	2	0	1	0
Subtotals	9	71	3.4	5	3	1	0	3.6	6	2	1	0	3.4	6	2	0	1	3.7	6	3	0	0	3.6	5	4	0	0	3.8	4	4	1	0
Univac DCT 500	4	13	2.5	1	1	1	1	2.8	1	2	0	1	2.5	0	3	0	1	2.0	0	1	2	1	2.5	1	1	1	1	2.8	1	2	0	1
Western Union																																
33 (Teletype)	3	34	3.0	1	1	1	0	3.0	1	1	1	0	2.7	0	2	1	0	3.0	1	1	1	0	2.7	1	1	0	1	2.7	1	1	0	1
35 (Teletype)	3	7	2.7	0	2	1	0	2.7	0	2	1	0	2.7	0	2	1	0	2.3	0	1	2	0	2.3	0	2	0	1	2.3	0	2	0	1
1200 1232 (GE)	3	1 765	2.7	1	0	2	0	3.0	0	3	0	0	3.0	1	1	1	0	3.3	2	0	1	0	2.3	0	1	2	0	1.3	0	0	1	2
Other models	7	1.266	2.8	0	5	1	0	2.8	0	5	1	0	2.7	0	4	2	0	2.5	1	1	4	0	2.7	0	4	2	0	2.3	0	4	0	2
Subtotals	16	3.072	2.8	2	8	5	0	2.9	1	11	3	0	2.7	1	9	5	0	2.7	4	3	8	0	2.5	1	8	4	2	2.2	1	7	1	6
Xerox 1700 Series	5	25	3.4	2	3	0	0	3.2	2	2	1	0	3.8	3	2	0	0	3.6	4	0	1	0	3.8	4	1	0	0	4.0	3	0	0	0
All Others	22	377	2.9	3	14	3	1	3.1	5	13	3	0	2.7	2	9	5	1	2.9	4	12	4	1	2.8	6	7	6	2	2.7	4	7	7	1
Grand Totals	307	14 775	3.3	116	154	28	7	3.2	105	151	38	8	3.2	94	149	31	9	3.0	78	156	61	9	3.2	121	134	31	14	3.0	89	129	47	15

Datapro Research Corp. Chart

Datapro tallied weighted averages (WA) from 307 users on a four-point scheme, where 4 = "excellent" (E), 3 = "good" (G), 2 = "fair" (F) and 1 = "poor" (P).

Tymshare Offers 'Smart' Terminal Driven by MPU

CUPERTINO, Calif. — Tymshare, Inc. has introduced an intelligent terminal driven by a 16-bit microprocessing unit (MPU) aimed at distributed processing applications.

Tymshare's Model 1100 terminal allows computing results to be stored locally on its companion Model 1105 dual diskette drive.

The terminal can be connected to the vendor's host computers, allowing interactive computing with editing and data validation.

Driven by the TMS 9900 MPU, the Model 1100 offers a 1,920 char. video display, 64K bytes of random-access memory and a typewriter-style keyboard.

The attendant Model 1105 dual diskette drive holds 256K bytes per drive — 512K bytes altogether, Tymshare said.

The 1100 and 1105 cost $4,625 and $3,930, respectively. Both units together can be leased for one, two, three and four years at $355, $335, $315 and $295, respectively, Tymshare stated.

Handling charges for both the terminal and the dual diskette drive are $150 each, Tymshare noted from 20705 Valley Green Drive, Cupertino, Calif. 95014.

DEC Unibus Users Get DCA Multiplexer

NORCROSS, Ga. — Digital Equipment Corp. Unibus-based computer users can now reportedly use a statistical multiplexer from Digital Communications Associates, Inc. (DCA) to connect remote terminals to the Unibus.

Only one DCA System 205/11 microprocessor-based circuit board is needed to support up to 16 DEC DZ-11 asynchronous terminal interface boards with 128 ports, while taking only one Unibus slot on DEC PDP-11s, Decsystem 20s and VAX computers. The 205/11 takes multiple streams of data characters from the host computer and concentrates them onto a single, bit serial trunk link.

The 205/11 internal structure consists of a DZ-11 emulator coupled to a DCA System 115 emulator, which is a statistical multiplexer that itself supports up to 32 ports. In effect, the 205/11 becomes both the DX-11 and local system 115 in an integrated unit, DCA claimed.

To the Unibus, the 205/11 looks like multiple DX-1 boards; to the DCA network, it looks like a standard DCA network processor, the vendor added.

Few software changes are needed to install a 205/11-based network because the 205/11 has the standard DZ-11 interface to the Unibus.

Communications protocols used by the System 205/11 are compatible with those of the other DCA systems in accordance with DCA's Integrated Network Architecture. At the other end of a 205's trunk link, the user can connect another 205, a DCA system 105 or 115 statistical multiplexer or a DCA System 150 full-function network processor to support connections for up to 128 remote terminals.

The 205/11 costs $4,000 from DCA at 135 Technology Park, Norcross, Ga. 30092.

Papers Needed Fast for PTC '80

HONOLULU — The deadline is coming up fast for submitting papers for the 1980 Pacific Telecommunications Conference (PTC '80), which will be held here this winter.

The meet is expected to be an international forum for the discussion of technical, economic, regulatory and social aspects of communications throughout the Pacific region.

Papers must be submitted by July 30; the conference will be held Jan. 7-9 at the Ilikai Hotel in Waikiki, Honolulu. Special consideration will be given to papers and demonstrations that involve more than one field or that relate disciplines to one another, according to PTC '80 Director Richard J. Barber.

For more information, contact Richard J. Barber at 2424 Maile Way, No. 704, Honolulu, Hawaii 96822. PTC '80 is sponsored by the University of Hawaii's Social Science Research Institute.

Includes Bar-Code System

Network Handles DP Load for Three Hospitals

Special to CW

MERRIAM, Kan. — A medical center here has acquired a network of terminals and bar-code readers that is reportedly more than a match for the 100% increase in patient capacity the center has undergone in recent years.

In fact, the system brings the center's DP operations to such a high standard of efficiency that, with an expanded staff, the system also covers the DP needs of two hospitals in neighboring Colorado.

In the past five years, Shawnee Mission Medical Center (SMMC) has grown from 178 beds to 373. During the same period, the hospital converted from after-the-fact financial reporting to an on-line system that reportedly embraces every aspect of in- and outpatient accounting.

SMMC's color bar-code system — NCR Corp.'s Medics — reportedly does not require that personnel learn elaborate procedures.

The on-line Medics operation at the hospital here includes 53 terminals. Twenty-four of these are NCR Model 275 electronic nursing station units with wand readers; nine are CRTs; four are 55 line/min printers for in- and outpatient admissions and the laboratory and central supply; and another 16 are thermal printers for such areas as the pharmacy and therapy stations.

Three minicomputers handle communications with the remote hospitals. The one in Kansas spools data onto magnetic tape until 1 a.m., covering all activity up through midmight at the Colorado sites.

The data is processed during the early morning hours, and the results are spooled onto tape for transmission to the two remote sites, starting at 6 a.m. The job is finished 1-1/2 hours later, 6:30 a.m. in Colorado.

The work for all three hospitals is done by the Mid-America Adventist Health Services Corp. (Maahs).

Harry Janke, vice-president of Maahs, said it evolved from a need to expand DP for the growing Shawnee Mission hospital.

The hospital benefits from the improved efficiency, of course, but so do its patients. Their doctors, given timely results of diagnostic procedures, can prescribe remedial procedures more quickly. The end result is shorter hospital stays.

Easy Operation

The keys to SMMC's efficiency are that the facility uses no plastic identification cards and that nursing personnel and their assistants do not have to work with unfamiliar typewriter-style keyboards of CRT terminals.

Each procedure that has been ordered is not only recorded with wand scanners in the on-line data base, but is spelled out in hard copy form at every relevant station. This procedure reportedly eliminates the lost orders or charges and the delays that can result from a reliance on paperwork.

The quantum leap in size, sophistication and completeness of DP for SMMC is, however, only one part of the DP operation that also involves the two hospitals in Colorado.

The 330-bed Porter Memorial Hospital in Denver, requires about as much processing as the 373-bed Shawnee Mission facility, Janke said.

As an example of how much more efficient the present three-hospital DP system is, Janke noted that the original DP staff of seven people performed only the financial work for the 178-bed CMMS five years ago, but now 36 staffers handle far more comprehensive applications for the three hospitals and their 818 beds.

Pair of Processors

The heart of the DP system is a pair of NCR processors, a Criterion N-8550 with 320K bytes of memory and a 640K-byte V-8570.

At present, the facility has the two CPUs, two multiplexers, three tape drives, eight magnetic disk spindles which each put 100 million bytes of information on line at a time and two printers — a 1,200 line/min model and a 300 line/min unit.

When SMMC decided to adopt the Medics approach, its NCR Century 101 32K processor was upgraded to 64K and some peripherals were added. That configuration handled the growing hospital's needs for three years. At that point SMMC took over the processing for Porter Memorial in Denver and 115-bed Boulder Memorial.

To accommodate this additional load, the 64K NCR 101 was replaced in November 1976 with the 320K Criterion.

At the outset of the Medics implementation, data was captured from remote terminals throughout the day, but retained in a memo file. The main data base was then updated at night.

For the conversion to a fully on-line mode, a second N-8550 system was installed in February 1977.

While the two "N" series Criterion processors provided the redundancy considered necessary, Janke said there were problems in meeting the turnaround deadlines.

These were overcome in April 1978, when one of the N-8550 processors was replaced with a 640K V-8570 model, he said.

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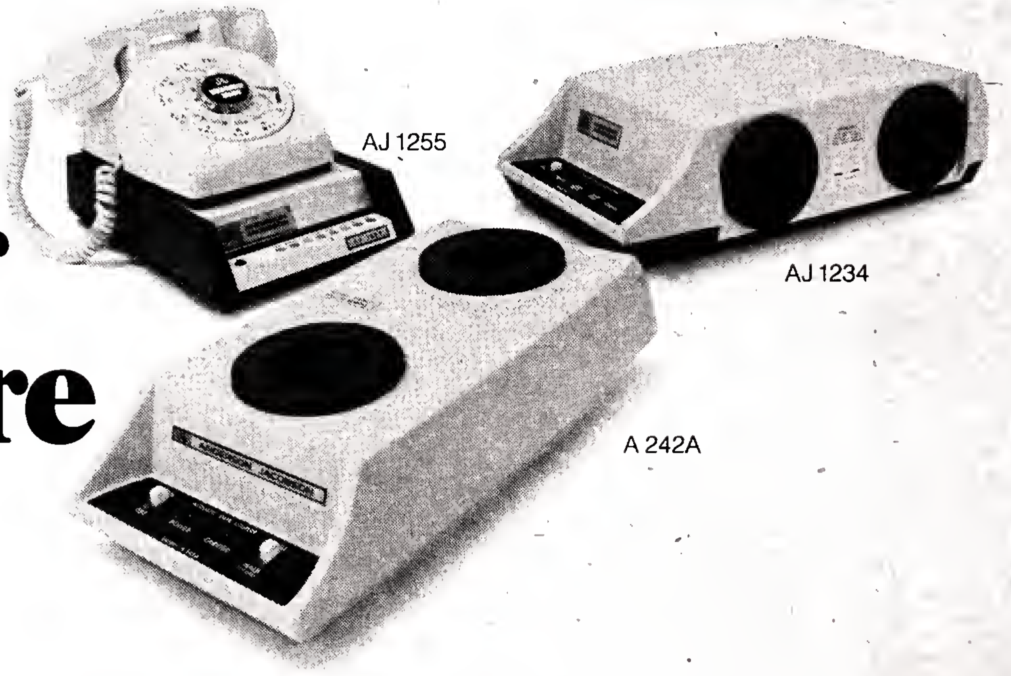

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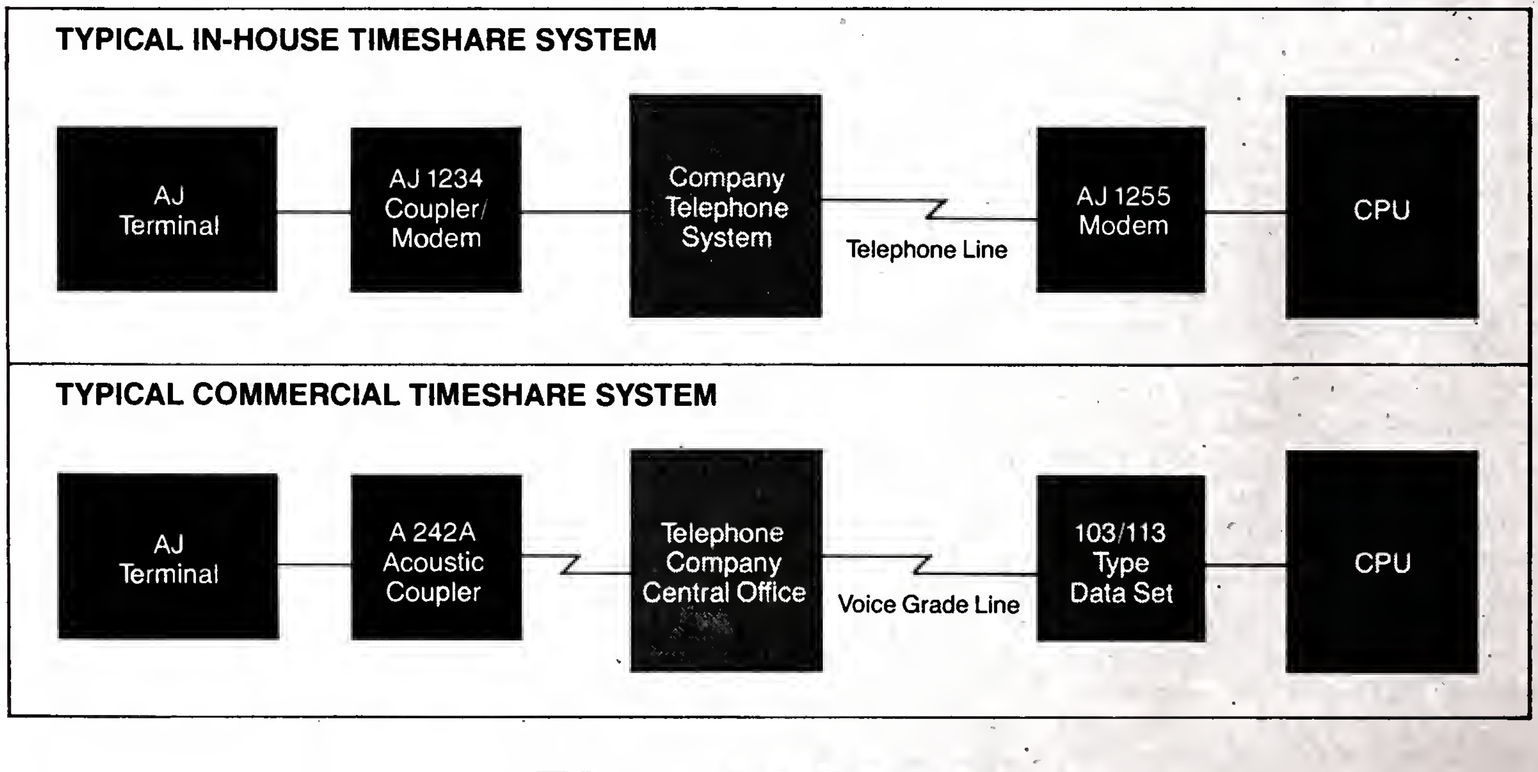

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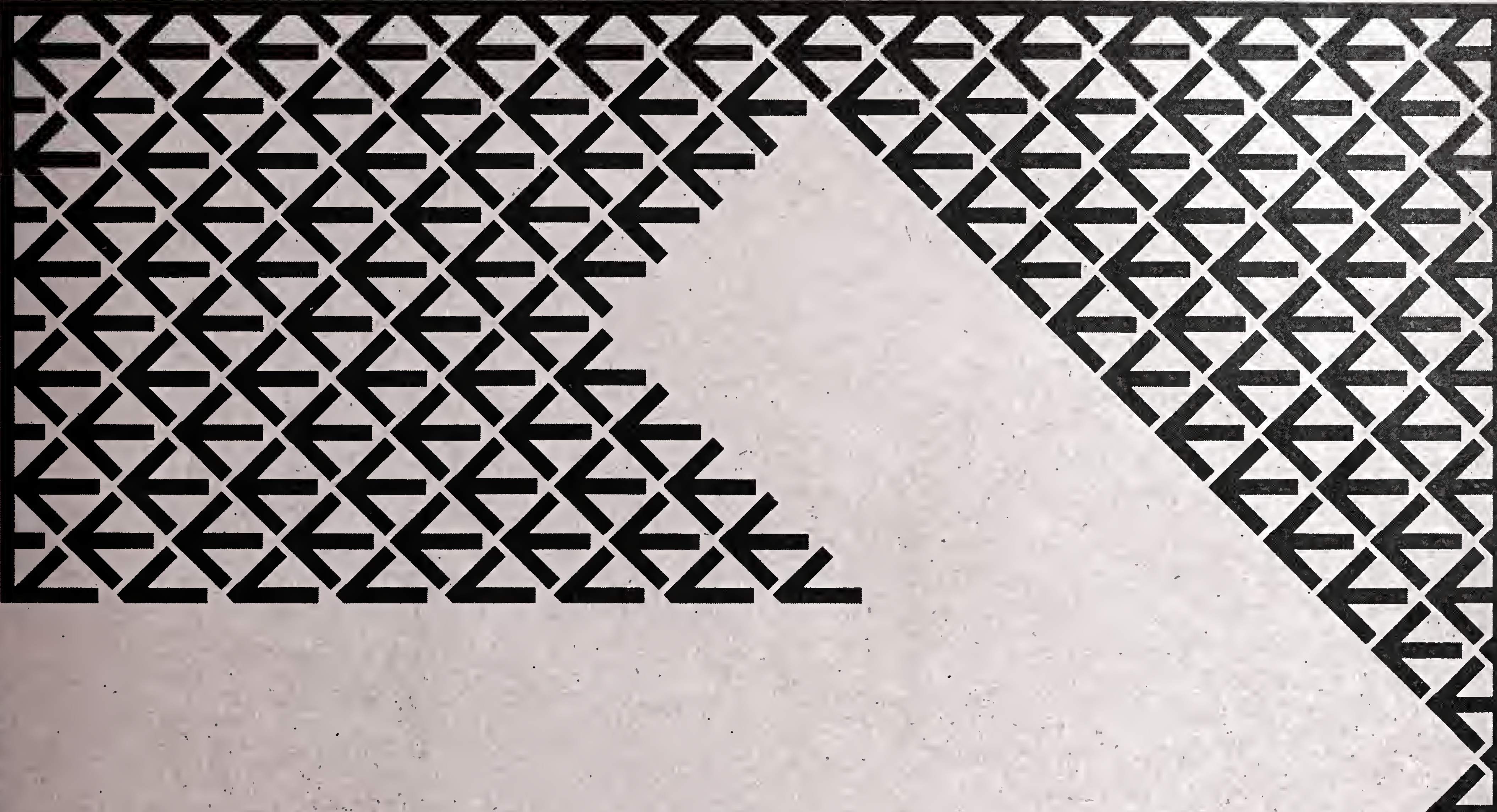

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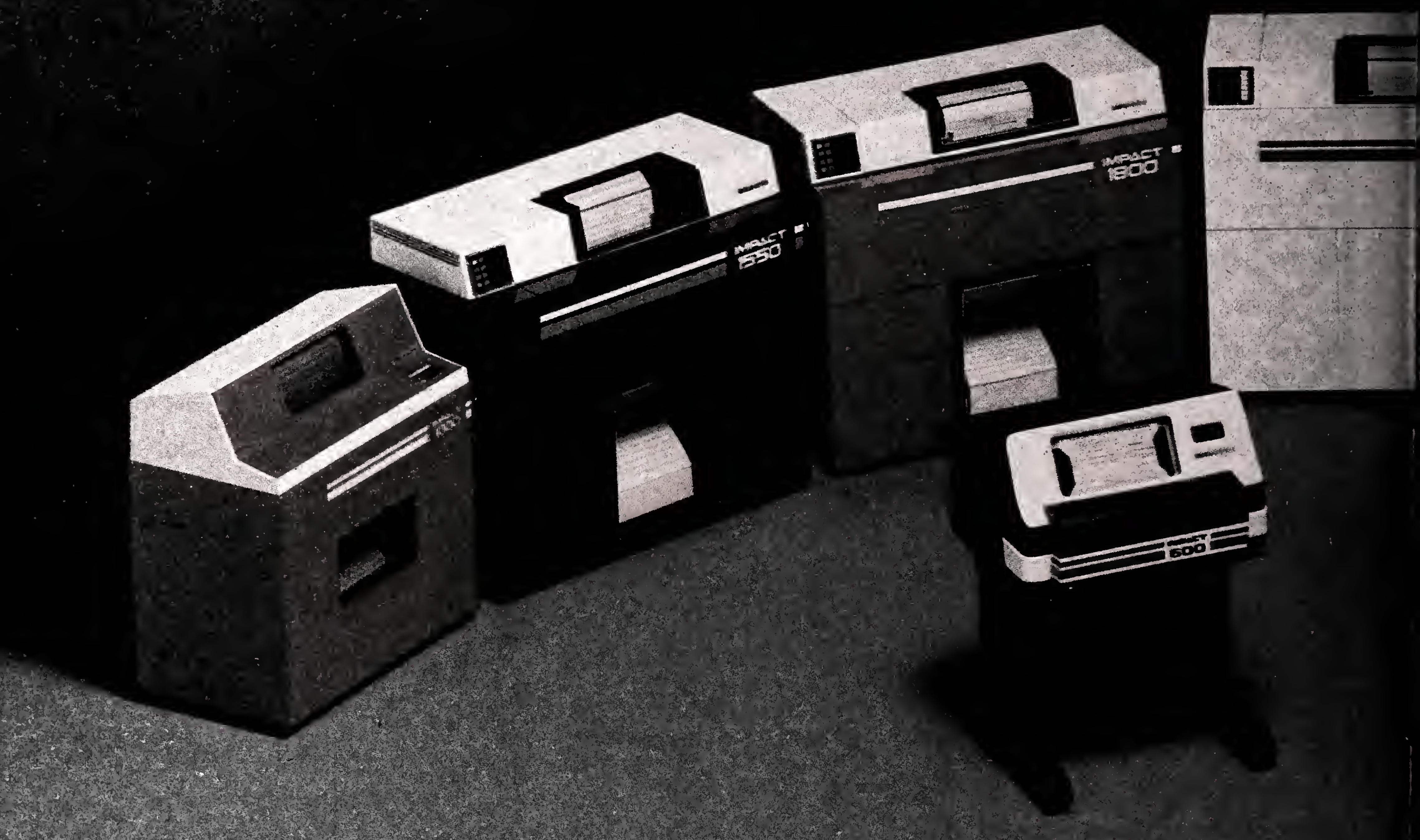

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With Affordable Hardware

Small Daily Paper Plunges Into Terminal Age

N. PLATTE, Neb. — High-speed electronic writing and editing equipment has replaced the manual typewriter in the newsrooms of large daily newspapers, but until recently small dailies have been unable to afford similar systems.

Dramatic reductions in hardware costs, however, have put the electronic newsroom within the financial reach of more small publishers.

While *The New York Times* requires 300 computer terminals for its staff of reporters and editors, small circulation dailies like the *North Platte Telegraph* here can now afford the two to 10 terminals they need for efficient newsroom operation.

The *Telegraph*, a 13,000 circulation daily covering central Nebraska, has been using electronic typesetting equipment and a Compustore data base storage computer for several years. Computer terminals, however, had yet to invade the newsroom. Last January, the *Telegraph* took the plunge and installed two Titus Communications 1700/Z terminals with 6K-byte memories in the editorial and advertising departments.

"People here are usually shy about new equipment and at first they were stand-offish," Jim Efta, electronics/-computer technician at the *Telegraph*, said.

"But as soon as the editors tried the Titus terminals, they starting screaming for more. They think the units are fantastic, and they want them as fast as we can get them."

The *Telegraph* responded by ordering five more Titus terminals. Ultimately, the paper could have 10 terminals, Efta said.

The newspaper uses two computer systems: an older Compustore with five floppy diskettes holding 150,000 characters each that serves as a feed-through data base into the second computer and a Hendrix Electronics, Inc. 6400 with two 1.5M-byte hard disks.

The chief advantage of the system in the *Telegraph* newsroom is speed. In the precomputer days, a story moved by hand from the reporter's typewriter to the editor's desk to the typesetting department. Under the new system, the copy flow is electronic and instantaneous.

The reporter types his story on a computer terminal instead of a manual typewriter. The copy boy has been replaced by a "send" command, which relays the story to the editor's terminal for final touches. The editor then transmits the story into on-line phototypesetter instead of sending it off to a manually-operated linotype.

The terminal's ability to insert and delete a character, word and/or paragraph is similar to most word processing systems. Using the scrolling keys, the reporter may roll copy up or down on the terminal's 1,920-char. screen.

The reporter can develop his own formats for frequently used functions. Since a single key instruction on the terminal signals a complete 78-char. display, the reporter may make his byline a format and flash it on the screen with the press of a key.

To make research data and current news more accessible to reporters, the *Telegraph* and other papers interface their equipment with storage computers and wire services.

A completed article goes to the editor's terminal. The editor reviews the story using the same character, word and paragraph delete and insert functions. The editor may also indicate phrases to be printed in italic or stories to appear on page one.

If a prior story is displayed on the editor's terminal while another story is being transmitted, the screen will flash the word "more" to alert the editor that a story is waiting.

Finally, the story is transmitted electronically into one of two on-line phototypesetters at the *Telegraph*.

The *Telegraph* is one of 80 papers around the country using the Titus newsroom system. That's only the beginning, according to Lee Fox, president of Titus Communications in Dallas.

"With some 1,750 dailies and 11,000 weeklies in the U.S. and Canada and 70% of the dailies with circulations under 25,000, I concluded that our niche would be the smaller papers that would like to emulate *The Washington Post* and *The New York Times*," Fox said.

Price is a chief attraction of the Titus system, Fox claimed. "Starting with a Hazeltine Corp. 1500 computer terminal, we add our proprietary software program and enhanced 6K or 18K [-byte] memory capacity, and we sell our low-end 1700/Z system for $1,995 per terminal. The large newspapers generally require systems that cost $3,000 to $4,000 per terminal," Fox said.

The Titus system has worked well at the *North Platte Telegraph*, Jim Efta said. But there was one start-up problem.

"The software was junk on the original terminals," Efta said. "It was not up to snuff as far as I was concerned, but once we got the software squared away, the terminal ran well. We received good support from Titus, and that helped."

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"We need the order-entry tracking system by the 1st. The budget consolidation in two weeks. The sales forecast next week. And the seating arrangement for my daughter's wedding by tomorrow."

No-Gimmick Approach to Budget Cut Best

(Continued from Page 75)

company was initiated in August 1976. Responsibility for results was given to the corporate director of Information Systems.

Each existing communications service — voice, data, TWX and facsimile — at all company locations was included. The purpose, frequency of use and cost of each service was analyzed and challenged. Alternative ways of providing the services were considered and, in some cases, simulated in a computer model.

The study was completed within three months and recommendations were implemented by year end, with virtually every area of the company affected. In summary, the survey developed data concerning the communications services which support the needs of Church & Dwight's Arm & Hammer brand products group and its specialty chemical business.

Voice and facsimile services accounted, in 1976, for more than 80% of the total communications cost, with data communications accounting for the rest. The bulk of data communications takes place between midnight and 6 a.m. During this time, the Church & Dwight computer transmits order information to 30 or more public warehouses located in major cities.

Daytime communications are primarily needed for voice traffic, with some data communications for remote job entry (RJE) transmissions to and from its plants in Syracuse, N.Y., and Green River, Wyo.

Each communications use was analyzed extensively. Alternatives were explored, recommendations were made and actions were implemented as quickly as possible.

Several alternatives were immediately justified. Operator-controlled Wats service for voice traffic was one obvious choice. By the time the study ended, enough voice traffic had developed to justify adding a tie-line to Syracuse which also could serve the RJE data communications needs. Within a year, an urgent business need arose which justified a computer in the Green River plant, allowing the RJE data transmission rate to increase to 4,800 bit/sec.

These actions were helpful and cost-effective, but not as significant as the cost savings which arose from the innovative use of the Wats lines for data communications.

Many companies piggyback data communications at night on Wats lines used during the day for voice traffic. But few appear to have used Wats to slash their Western Union TWX bills to virtually nothing.

This cutback worked primarily because of the way Church & Dwight operates its order processing system. Orders for all Church & Dwight products are processed through a central order processing department. Each night, following the order processing cycle, the order entry system reviews its order files and pulls together all orders for each plant and warehouse from which shipments are scheduled for the next day.

The computer then automatically calls each location and sends, unattended, the picking and shipping information to the warehouse TWX machine.

Good, but not original. Much more than good, however, is the fact that the communications cost for this service just about goes away and does not require a dedicated terminal in the warehouse.

Handy Device

From his reading and study of tariffed devices, the consultant remembered a little-used Western Union device (#13453A switch) that allows a teletypewriter to receive equally intelligible signals from either the TWX network, to which it is usually hooked, or over the Bell System Direct Distance Dial or Wats network. The only other requirement is a telephone line to the teletype machine.

The total cost is $7.50/mo for the Western Union device on each teletype machine and about $17.50/mo for a telephone line.

The Wats lines, which were justified for voice use, have plenty of unused time each month. Therefore, they come "free." Even at overtime rates, the total cost would be less than that of using the TWX network. Data communications to 30 warehouses is about $750/mo now vs. $6000/mo or more for TWX.

After a round of meetings within the company explaining what was to be done, a procedure was established to initiate the service at all warehouses. Though it took time to get Western Union to respond, and to carefully explain to the Bell companies around the country what was being done, by the end of 1977, the full system was operational.

Davis is assistant to the president and corporate director of information systems for Church & Dwight in Piscataway, N.J.

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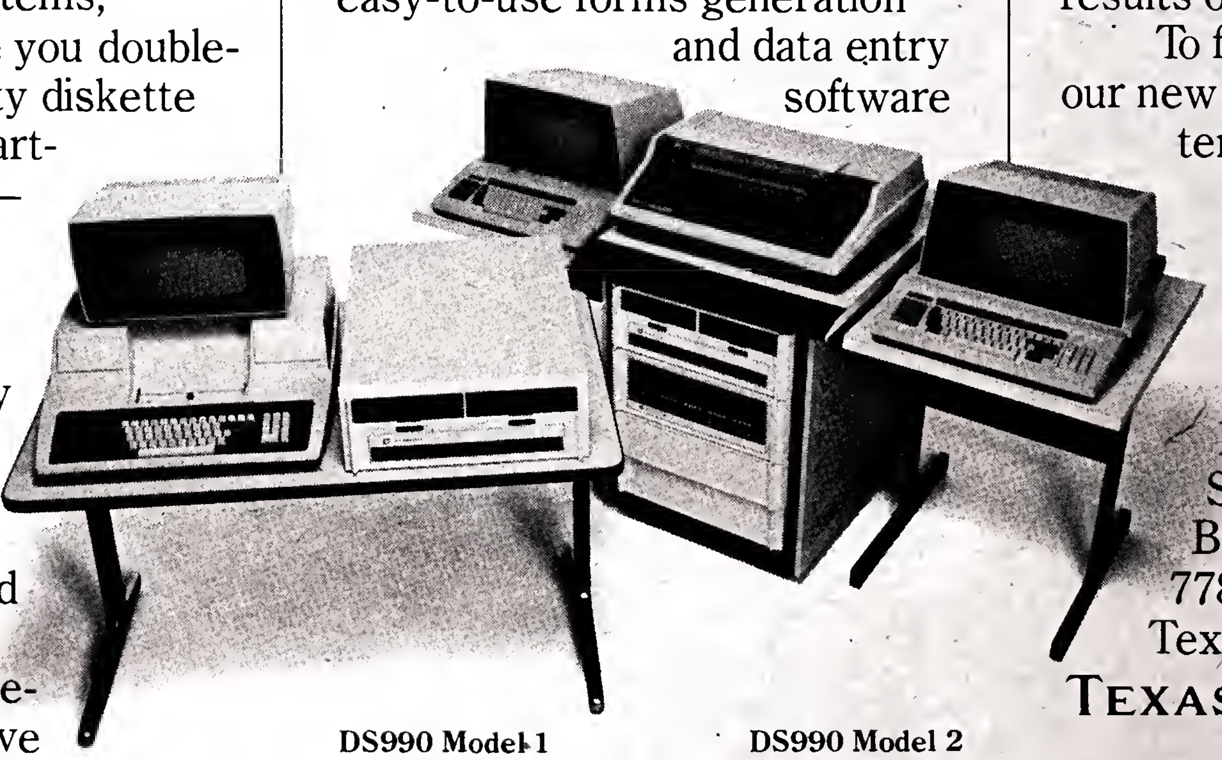

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Particular Threat This Summer

Five Methods Handle Power Variances

By David C. Griffith
Special to CW

With summer here and various types of energy shortages in the news daily, it has become important for users to protect their machines from electrical damage. This tutorial — written by the vice-president of Cyberex, Inc., a manufacturer of power conditioning equipment located in Mentor, Ohio — discusses some approaches to the problem.

While computer technology has been advancing rapidly and often radically, the quality of electrical power generally distributed by utilities has not kept pace. Variations caused by power factor correction switching, the application and removal of heavy electrical loads, lightning, broken or obstructed power lines can result in power that is unacceptable to the circuitry in modern computers.

To overcome these problems — particularly in view of many of the uncertainties concerning power quality and supply, both now and in the future — users can condition their electrical power using five basic types of equipment: isolation devices, line voltage regulators, line transfer systems, ride-through systems and uninterruptible power supplies (UPS). The type of system required depends upon the characteristics of the computer itself, how it is used and the quality of power available from the utility at the computer location.

Isolation devices are probably the simplest power conditioners available. In their basic form, they are isolation transformers that provide a stepdown from distribution voltage (typically 480V) to computer voltage (typically 120/208V) and at the same time provide a separate ground for the computer, independent of the power line.

The most common isolation transformer is a device with separate primary and secondary windings. However, some systems require isolation from "common mode" noise, voltage variations that are common to all power input lines, with respect to ground or the chassis.

Although a two-winding device alleviates this problem somewhat, systems sensitive to common mode noise require a transformer with an electrostatic shield between the windings. These "high isolation" transformers attenuate high frequency, "transverse" noise (noise from line to line), but cannot provide regulated voltage when the input (ac) line voltage varies.

In fact, when used by themselves, these devices may aggravate a voltage-variation situation because of their own high impedance.

Incorporating a filter capacitor with the transformer results in significant additional reduction of this transverse noise.

Isolation transformers range in capacity from a few VA to hundreds of kVA. Several manufacturers have recently combined them with load distribution panelboards and power cables in a single cabinet for simple installation in computer rooms. This provides some protection and can result in a considerable savings on electricians' fees when a computer room is moved or reconfigured.

Line voltage regulators provide constant voltage despite wide variations in the input power, such as those caused by summer

(Continued on Page 90)

Intel Has Solid-State Drum Emulating IBM 2305/2835

SANTA CLARA, Calif. — Competition in the solid-state drum replacement arena heated up recently with Intel Corp.'s announcement of the Fast-3805 semiconductor disk storage subsystem.

The system will give users an alternative to two other solid-state-based, random-access device replacements — Storage Technology Corp.'s 4305 solid-state drum and the Memorex Corp. disk cache.

The Fast Access Storage Technology (Fast) 3805 is a random-access-memory (RAM)-based device that emulates IBM's 2305/2835 mechanical drum storage as well as the IBM 3350/3830 disk, but has faster access times and greater transfer rates, a spokesman claimed. In addition, the device can reportedly triple disk traffic without adding new channel or controller capacity.

Heavy I/O traffic, caused by IBM's MVS, TSO or IMS software, causes many installations to become I/O bound, the firm said. The Fast-3805 can improve system performance without forcing users to upgrade thier CPUs, add to main memory or add a fixed-head disk.

The device uses high-speed, low-power dynamic RAM to give users a storage capacity of from 12M- to 72M bytes, with a maximum access time of .4 msec. Its standard data trasnfer rate is 1.5M to 2M byte/sec, the firm claimed, depending on the host CPU channel characteristics and the channel cable length.

An optional 2-byte-wide feature increases this transfer rate to 3M- to 4M byte/sec, and options available on the hardware allow it to be attached to four channels to achieve an aggregate transfer rate of up to 16M byte/-sec.

Included in the hardware is the company's iSBC-86 single-board computer, which

(Continued on Page 88)

Honeywell Hikes Prices On Some Older Gear

WALTHAM, Mass. — Honeywell, Inc. has announced price hikes for what it termed "products not currently marketed actively." The increases range from 2% to 5% on rental/lease charges and 4% to 7% on maintenance.

The hardware on which prices are being raised "does not account for a significant part of Honeywell's business," the spokesman noted. The increases will affect Honeywell's older equipment, such as its 200 and 2000 lines and some early Series 60/Level 66 hardware.

The price hikes were necessary because of the firm's increased costs of doing business, a spokesman said.

The charges are effective July 2 for what Honeywell termed "new business" and Oct. 1 for existing contracts.

Certain application software product charges are being increased between 5% and 7%, Honeywell said in a letter to customers, while certain service charges — system engineering, some education and training and Datanetwork charges — will rise by an average of 7%.

The equipment hit by the price increases, according to the spokesman, includes Level 66 and 68 non-DPS central systems, Series 200 CPUs and selected peripherals, Series 2000 CPUs and selected peripherals, the firm's Keyplex equipment and "selected" Page Printer System products.

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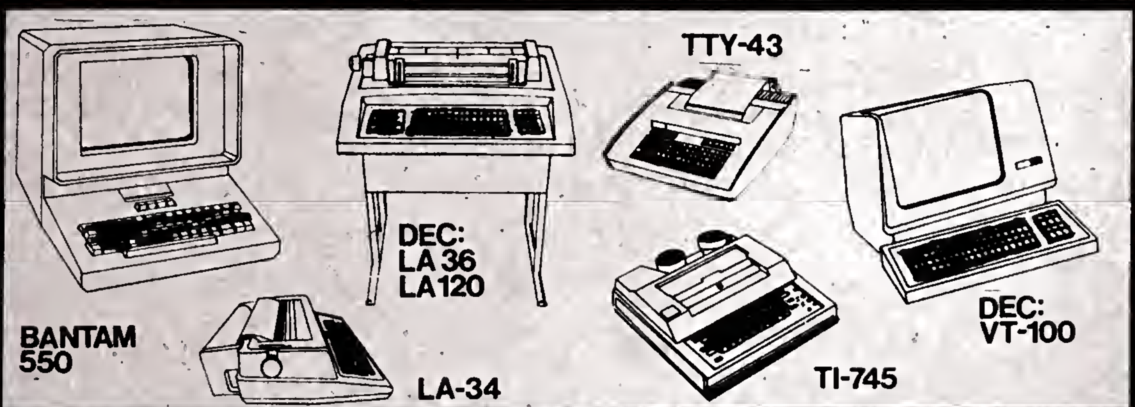

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Intel Brings Out Solid-State Drum Replacement

(Continued from Page 87)

manages the IBM 370/370X channel protocol. This makes the system totally transparent to the host, the firm explained.

Scheduled for fourth quarter 1979 delivery, the system, in an 11.2M-byte configuration, is said to require 50% less floor space and 74% less power and generates 59% less heat than an equivalent IBM 2835/2305 configuration.

The device, which uses 16K-bit dynamic RAMs, is said to automatically check and correct itself by continuously cycling through memory, reading the data and performing diagnostics. It detects and corrects any single- or double-bit errors, simultaneously recording in its memory the location of any error.

If a predetermined threshhold number of errors is located, the system automatically transfers the contents of the affected area to spare storage and redirects subsequent accesses to the new location. At the same time, the Fast-3805 provides an external indication of the failure so that the board or individual memory elements can be replaced, Intel explained.

A system log on which failures are recorded has its own battery so that the information is retained even if power outages occur. The on-board computer also monitors and reports any power voltage variations, the firm continued.

In addition to the other advantages of a solid-state system over a mechanical one, channel overrun — which occurs when a channel is unable to achieve the data rate of the controller — is eliminated, the spokesman contended. This is because of totally random-access nature of the sytem and the storage-to-storage data transfer that can react as fast as required by the channel.

The unit operates in 2835/2305 mode and 3830 mode. In the former, the device can include the equivalent of from one to four independent 2835 controllers, the firm explained. Each logical 2305 then has 11.2M bytes of storage, although this can be increased (in increments of 11.2M bytes) to 67.2M bytes.

The unit can also contain from one to four independent 3830 controllers in that mode, the firm said, each with one logical 3350 drive attached. In that mode, the minimum 3350 configuration has 12M bytes of memory. Maximum storage in this mode is 72M bytes.

The unit is powered with a motor generator that allows the storage device to coast through power fluctuations lasting up to 200 msec.

All Fast-3805 systems are available on purchase or lease plans ranging from 24- to 60 months, the firm announced. A typical configuration of one controller and 12M bytes of storage leases for $4,305/mo (24-month lease) or sells for $130,500, which the firm said was 95% and 80%, respectively, of IBM's prices for an equivalent configuration.

A configuration of two controllers with the 2-byte-wide feature, two channel switches and 48M bytes sells for $507,920 or leases for $16,790; these are said to be 69% and 76%, respectively, of IBM's prices except with 3M bytes less storage.

Additional information is available from Intel at 3157 N. 34th Drive, Phoenix, Ariz. 85017.

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All contributions should be typed, double-spaced and about four or five pages long. Send them to Howard A. Karten, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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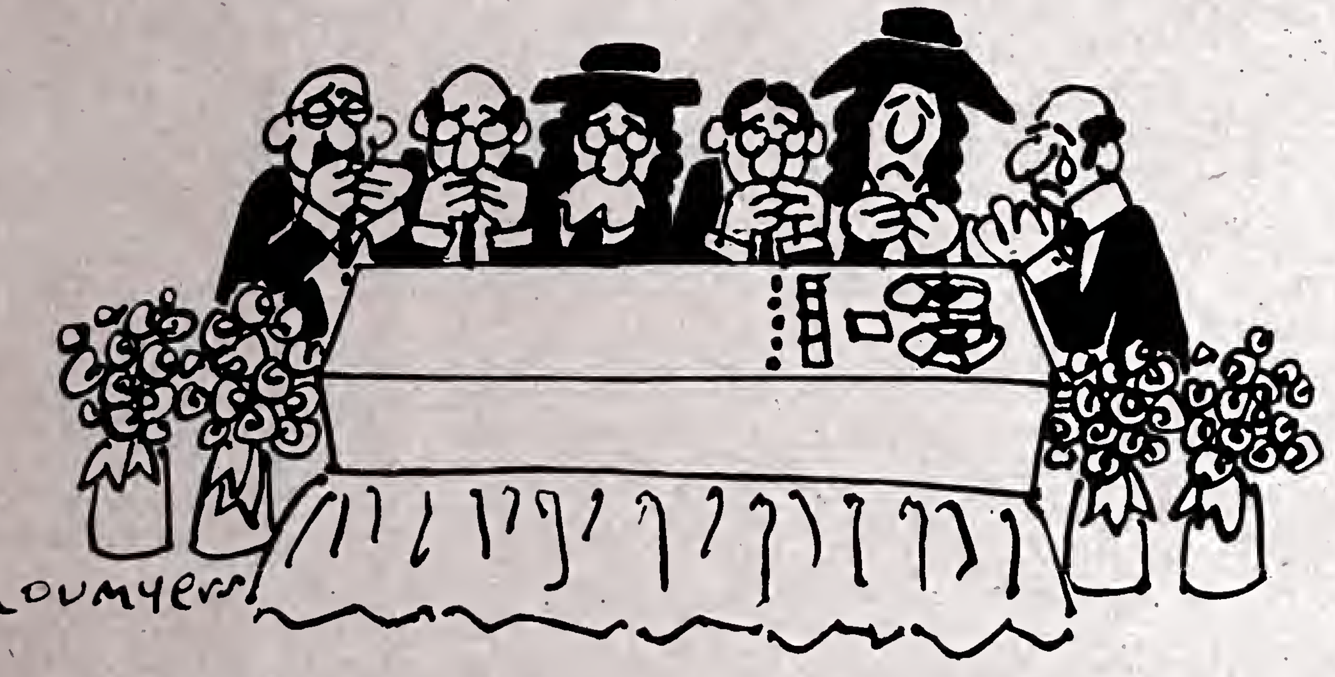

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Power Center Cuts Out Need for Hard-Wiring

COSTA MESA, Calif. — The Powerpac power center from Emergency Power Engineering is a portable peripheral that eliminates hard-wiring for computer systems and peripherals.

Ranging in capacity from 5 kVA, to 50 kVA, the unit can support a maximum of 36 separate cables to individual pieces of equipment. Available in input voltage ratings of 480-, 240- or 208 Vac and frequencies of 60-, 400- or 50 Hz, the unit features an isolation transformer with an electrostatic shield that is said to operate at 96% to 98% efficiency.

A system status panel on the unit can monitor input or output voltage, output current, system kVA or percent loading. Alarm indicators are provided for transformer temperature, transformer temperature shutdown and output over- or under-voltage.

The device is listed under standard UL-478 for DP equipment, the firm said, and meets standards of the National Electrical Code and Occupational Safety and Health Administration as well.

The device installs in less than two hours and "pays for itself the first time the computer is moved to a new location," a spokesman claimed.

Prices range from approximately $3,500 for a 5kVA unit up to $6,000 for a 50kVA unit, a spokesman said from 3595 Cadillac Ave., Costa Mesa, Calif. 92626.

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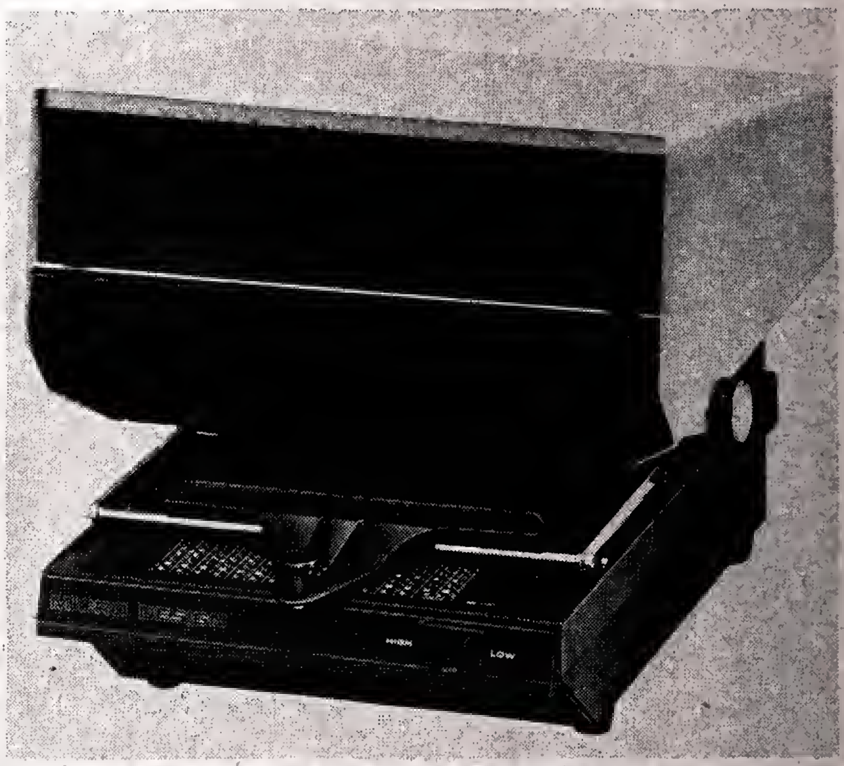

Model 905 Microfiche Reader

HARTFORD, Wis. — The Micro Design Division of Bell & Howell Co. has added three microfiche readers to its series of micrographic readers.

The Model 905, with an 11-in. by 2.5-in. nonglare screen, is suggested for applications that require reading only a few lines of data at a time, such as signature card verification and account balance.

Fanless operation and a 2,800-hour lamp life (maximum) are standard on the $210 unit, which also includes a range of drop-in lenses providing magnifications of 15x up to 52x, the vendor said.

Another reader, the Model 975, features an 11-in. by 8.5-in. nonglare screen and is suggested for viewing 3/4-size computer output microfilm or source document images. Options include dual lens capability, dual fiche carrier, 16/35 mm rollfilm attachment and a standard-sized fiche carrier. The Model 975 costs $210.

Largest of the units introduced, the Model 995 is full-sized with drop-in lenses ranging from 22X to 72X. Like the Model 975, this unit features 2,800-hour lamp life, fiche carrier and rollfilm attachments. Dual lens capability and a dual fiche carrier are also available on the $259 unit, the firm said.

The Micro Design Division of Bell & Howell is at 857 W. State St., Hartford, Wis. 53027.

Methods Handle Power Variations

(Continued from Page 87)

brownouts. A typical unit will accept 10% more than or 20% less than nominal line voltage and still maintain well-regulated voltage to the computer load.

Most of these devices are "static," using thyristor or magnetic control techniques. The devices can range from less than 2.5 kVA to several hundred kVA, essentially covering the entire range of computer systems.

Larger units may have high isolation transformers equipped with output filters and over-voltage transient suppressors that eliminate voltage spikes and are thus more effective than the simple isolation transformers. Most of these devices will not provide for momentary loss of input power.

This problem can be overcome with a *"ride-through system"* that can sustain a short total power loss without loss of normal output. The most practical of these systems is a motor generator set, consisting of a synchronous ac motor connected to a synchronous ac generator, usually with a flywheel for energy storage.

The generator derives power from the line, supplying it mechanically to the generator and thereby providing common-mode and transverse-mode noise rejection. Voltage regulation is provided by automatic control of the generator, with the flywheel providing for *limited* loss of power (typically a few cycles) before the generator frequency drops below tolerance because of a flywheel run-down.

Declining Use

Although these systems, too, are available in the range of a few kVA to several hundred, their use is declining because of noise, maintenance requirements and low efficiency compared with static UPS systems.

Many of these problems can be overcome with a solid-state *line transfer system.* If a computer room is, or can be, equipped with a dual power feed from the utility, the facility can use a high-speed, solid-state, automatic bus transfer switch to transfer to an alternate source if the preferred source should deviate. By sensing and switching within one-quarter of a cycle, they can provide essentially continuous power, satisfactory for modern computers, with an efficiency greater than 99%.

Line transfer systems can be coupled with a line voltage regulator and an isolation transformer, as previously described, to provide conditioned power without interruption.

Available in the range 2kVA to several hundred kVA, these systems require that the two sources be no more than a few degrees out of phase with each other.

BASF Drives Said Compatible With IBM 3310

BEDFORD, Mass. — The Series 6170 fixed disk drives from the BASF Systems Division of BASF Wyandotte Corp. are said to be the first independent, fixed-disk drives to use media compatible with IBM's 310 "Piccolo" drive.

The $2,100 Model 7171 stores 8M bytes, while the $3,100 Model 6172 holds 24M bytes, both on a 210 mm disk. Additional information is available from BASF at Crosby Drive, Bedford, Mass. 01730.

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Operates Off-Line Only

Printer Works at 18,000 Line/Min

DETROIT — Burroughs Corp. has entered the electronic printing market with the B9270-35 page printer.

The device — a relative latecomer to high-speed xeroxographic/laser printing arena — prints on standard 8-1/2-in. by 11-in. pages at a rate of up to 18,000 line/min, depending on the data format, a spokesman for the company said.

Using a laser beam with a resolution of 90,000 dot/sq in., the device can vary line spacing from 3- to 18 line/in. and character spacing from 4- to 30 char/in., the spokesman said.

Operating off-line only, the device accepts data from either 9-track,. 1,600 bit/in. phase-encoded or 9-track, 6,250 bit/-in. group coded recording (GCR) format tapes and buffers this data onto a disk embedded in the printer.

Data needed for corporate logos or for creating special forms is stored digitally in the unit and created electronically on the printed pages as needed. This is said to eliminate the need for forms overlays as well as the use of most preprinted forms.

New forms are said to be easily created on the unit.

The printer, carrying a list price of $332,500, is aimed particularly at Burroughs systems users in major metropolitan areas, according to the spokesman.

The base monthly maintenance charges in these areas are $2,318/mo for a 24-hour day, seven-day week or $2,130/mo for a 16-hour day, seven-day week.

Prices in nonmetropolitan areas vary as a function of location and density of Burroughs hardware.

Page charges for the unit are set at .0015 cent/page, with a minimum monthly charge for pages set at $1,800.

Monthly lease charges, including an around-the-clock maintenance agreement, are set at $9,250/mo on a one-year basis, $8,100 on a three-year basis and $7,750 on a five-year basis.

Regardless of the term selected, the page charge for leasers will be set at .002 cent/page, the spokesman said.

A font library and the software necessary to operate the system are included in these prices, the spokesman said from 1 Burroughs Place, Detroit, Mich. 48232.

Tape Heads Get Cleaning Solvent

MONTEREY, Calif. — A $10 kit of tape head cleaning products from Datacq Corp. contains a 4-oz can of cleaning solvent, 24 lint-free 2-1/2-in. by 3-in. wipes and 24 cotton swabs.

The solvent is specially blended for magnetic tape equipment and is said to be compatible with almost all tape heads.

Quantity discounts are available, the vendor said from Datacq Corp., P.O. Box 3200, Monterey, Calif. 93940.

Laser Printer Links To Range of CPUs

SAN DIEGO — Datagraphix, Inc. has introduced an off-line laser printer said to print at speeds up to 21,000 line/min.

The Model 9800 laser printer — the company's first venture into high-speed, hard-copy printing — will accept tapes from a range of mainframes, including IBM, Univac, Burroughs Corp., Control Data Corp., Honeywell, Inc. and others.

The Datagraphix 9800 Printer

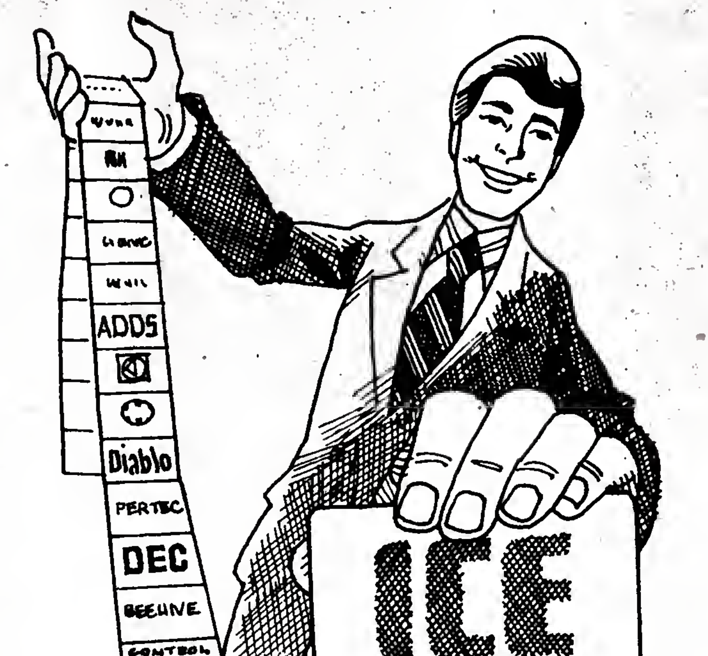
The printer, which has a print resolution of 180 dot/in. horizontally and 144 dot/in. vertically, comes with three character sets of 85 characters each. The user can select these sets from a menu of 20, a spokesman said.

The unit accepts standard fan-fold, pin-feed forms ranging from 6.5 in. to 15.8 in. wide, the spokesman continued. In addition, the length of the forms can range from 3.5 in. to 14 in. in 1/6-in. increments.

Three different character sizes are available, according to the spokesman: 10-, 12- or 15 char./in, with line spacings of 6-, 8- or 12 line/in.

The printer combines a printer subsystem made by Siemens AG with control electronics provided by Datagraphix, a subsidiary of General Dynamics Corp. The same printer subsystem forms the heart of an on-line laser printer unveiled last year by Itel Corp. of San Francisco.

Prices for the unit have not yet been determined, the spokesman said. First shipments are expected in the spring of 1980, he added from P.O. Box 82449, San Diego, Calif. 92138.



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OCRUA Winter Meet To Be Held Jan. 13-16

HACKENSACK, N.J. — "Increasing Data Entry Productivity Through Optical Character Recognition (OCR)" will be the theme of the Optical Character Recognition Users Association (OCRUA) winter conference, to be held January 13-16 in Orlando, Fla.

The conference will emphasize the role that OCR has played, and is expected to play to an increasing degree, in improving data entry.

Keynote speaker for the conference will be Jay R. Reese, president of Recognition Equipment, Inc. Arnold Keller, editor and publisher of "Infosystems," will also be a featured speaker.

Scheduled sessions will focus on banking, payment processing, government, manufacturing/retailing and voice recognition, and several sessions covering the fundamentals of OCR will also be presented.

Registration fee is $155 if paid by Aug. 31 or $185 after that. Further information on the conference, to take place at the Orlando Marriott Hotel, is available from 10 Banta Place, Hackensack, N.J. 07601.

Printer Produces 1,100 Line/Min

MALDEN, Mass. — Data Printer Corp.'s Model 3901 printer, the latest addition to the company's 3000 series, features a maximum speed of 1,100 line/min. with a 48-character print set, according to the firm.

Scheduled for fourth quarter shipment, the $7,700 OEM unit accepts up to 6-part forms and has full-line buffering with line spacing of 6 line/in.

The unit prints at 10 char./-in., according to the firm, and has a paper slew speed of 15 in./sec. Additional information is available from the company at 99 Middlesex St., Malden, Ma. 02148.

Matrix Approach Advised for System Audits

By Tim Scannell
CW Staff

DENVER — Although the design resembles a child's basic mathematics "times table," the concept is much more advanced.

By using a block-like chart listing each integral part of a computer system and where each of those parts intersects, auditors can review an involved DP setup without getting lost in an operational maze, according to Dr. Jerry Fitzgerald, a data communications consultant.

Present computer systems with their data bases, communications capabilities and distributed stations are so involved that the only way an auditor can successfully inspect a computer's operation is to break it up into its various parts. "On-line, real-time systems are so complicated that you can't audit the whole system at the same time," Fitzgerald said at a recent meeting of the EDP Auditors Association here.

"Auditors can't attack an on-line, real-time system, with all its innuendoes, in one package," the consultant explained. After the system has been broken up, audits should be run separately on distributed intelligence components, communications and processing programs.

Fitzgerald's idea is to start with an empty matrix, little more than a blank piece of paper, and fill in all the parts of the DP system and where certain security threats or potential disasters might present a problem. The size of the matrix and number of intersections depend upon the size and extensiveness of the system, he stated.

The first matrix or auditing battle plan should be simple and be filled in mostly with the system user's help because they will most probably know exactly where certain system threats exist, Fitzgerald explained. "That way they're a part of it . . . and they have time to think about it and talk about the controls."

The matrix itself should include both a look at the operating system manuals and the system generation manuals to try to uncover all audit implications. Then, the auditor should scrutinize the physical security of the whole system as well as the security at remote sites, Fitzgerald pointed out.

Additional Inspection

In addition, the chart should pinpoint where general organizational controls exist, where the duties of power lie and who has overall responsibility. The matrix should be interrelated to initial flowcharts to see if any system flaws existed in the original design.

The user should look at every "vertical, horizontal and individual cell" in the matrix and "start thinking of looking at it in a piece-by-piece fashion," Fitzgerald added.

Booklet Covers Access Control

CHATSWORTH, Calif. — An 80-page illustrated booklet covering the historical development of electronic security systems, the state of the art in access control devices and a series of case studies is available free from Cardkey Systems, a division of Greer Hydraulics, Inc., here.

"Access Control Systems" is said to examine the industry to date, including the entire range of access control devices. Included in the book is a glossary of access control terms.

The booklet is available from Cardkey Systems at 20339 Nordhoff St., Chatsworth, Calif. 91311.

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Replaces Standard Copiers

Firm Cuts Page Printing Costs $22,000/Year

MINNEAPOLIS — By replacing several conventional office copiers with an off-line page-printing system and reducing the complement of people involved in paper distribution, General Mills here has managed to save an estimated $22,000 per year, according to company officials.

In 1976, the company began to evaluate alternatives to the system it was then using, which included three standard copiers used to make additional copies. In December of that year, it brought in a 12,000 line/min Honeywell, Inc. page-printing system (PPS); that unit worked out so well that it was upgraded to 18,000 line/min half a year later, the officials stated.

At that time, an additional 8-pocket stacker was added for greater flexibility and throughput.

"Little Brother"

Nearly a year later, the device received a "little brother," a unit capable of printing at 7,800 line/min.

"The primary benefits of the system are in three areas: print quality, peak-load power of the system and number of post-printing operations," according to Don Nawrocki, manager of computer services for the Consumer Food Group with the company.

The company's peak printing load comes at the end of each fiscal month, when it prints more than 700,000 pages in a five-day period. To do that, both printers run "flat out" for that period, Nawrocki said.

Use of the PPS has reduced the bursting and decollating operations required and entirely eliminated the need to copy output, he claimed.

No Smudge Troubles

Another benefit of the system is that recipients of the printed reports are no longer concerned over who gets smudgy, hard-to-read copies because every page is an original. The company has also been able to reduce the department responsible from nine to three people, and one operator can handle both systems.

The result has been a greatly improved turnaround time, since printed reports now go directly to the mail distribution system, rather than through a time-consuming, labor-intensive, post-printing process, officials stated. And space requirements have also been cut.

Ease of operation is also important to the company. For example, Jack Clifford, manager of operations, said, "The operators like the system because they always know what's going on with it. It will not crash if left unattended, and it sure beats having to change forms and messing around with carbon paper."

Disk Stores 90M Bytes

BEDFORD, Mass. — BASF has begun production of its Model 650 double-density, Winchester technology disk platter with a capacity of 90M bytes, the firm announced recently.

Intended for use with double-density, fixed-disk drives such as the Storage Technology Corp. 8650, the platter can store up to 7,000 bit/in. and 600 track/in. The platter is suitable for start-stop low-pressure heads flying as low as 20 microin. above the surface, a spokesman claimed.

The disk is priced at $135 in single quantities, with OEM discounts available, a spokesman said from the company at Crosby Drive, Bedford, Mass. 01730.

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For more information about Tab's Forms Handling Equipment, write Tab Products Company, 2690 Hanover Street, Palo Alto, California 94304. Or call (415) 493-5790.

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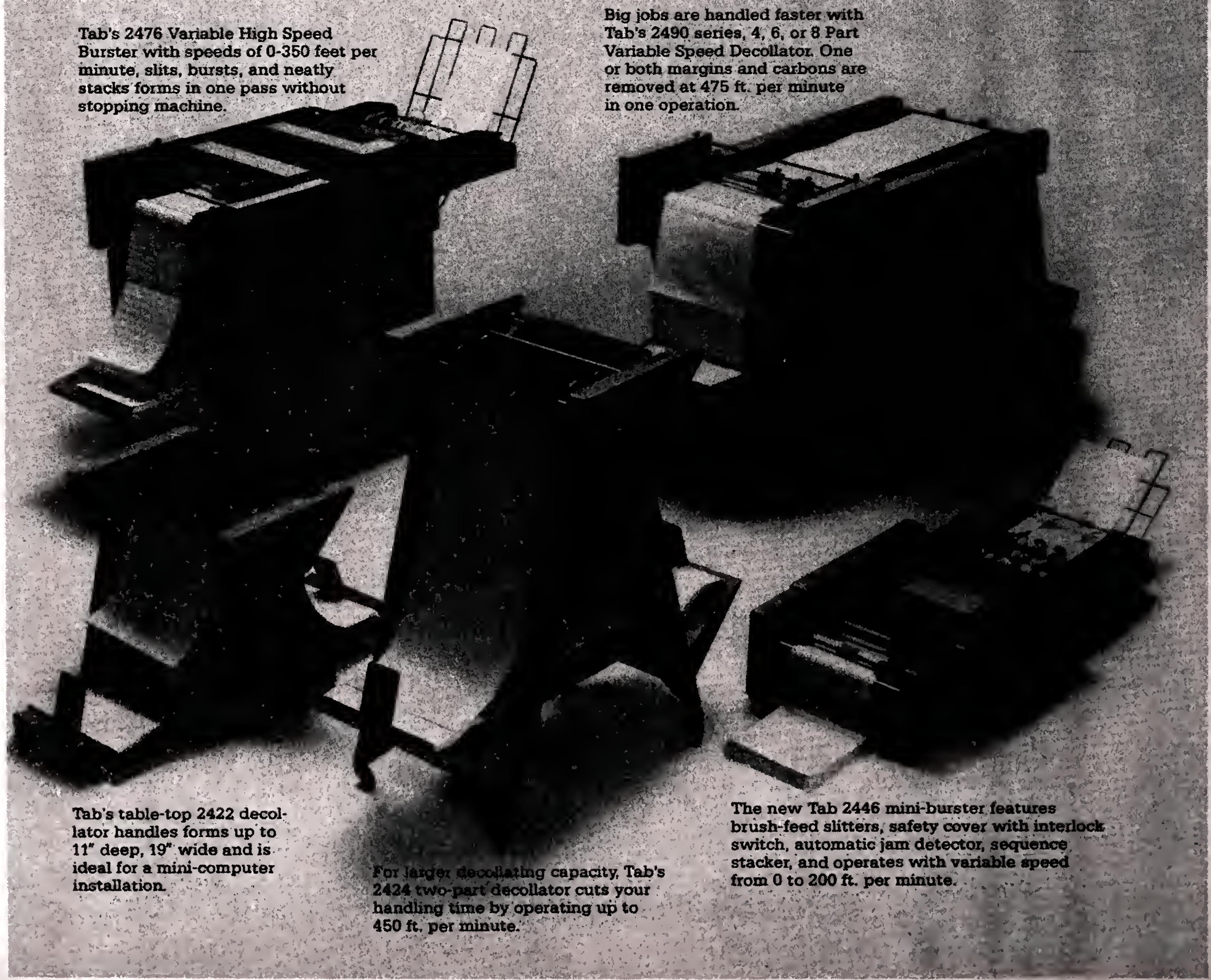

Tab's 2476 Variable High Speed Burster with speeds of 0-350 feet per minute, slits, bursts, and neatly stacks forms in one pass without stopping machine.

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Tab's table-top 2422 decollator handles forms up to 11" deep, 19" wide and is ideal for a mini-computer installation.

For larger decollating capacity, Tab's 2424 two-part decollator cuts your handling time by operating up to 450 ft. per minute.

The new Tab 2446 mini-burster features brush-feed slitters, safety cover with interlock switch, automatic jam detector, sequence stacker, and operates with variable speed from 0 to 200 ft. per minute.

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To Help Students 'See' Concepts

RPI Gets Interactive Graphics System

By Tom Henkel
CW Staff

TROY, N.Y. — The old saying "A picture is worth a thousand words" is a reality for about 2,000 engineering students at Rensselaer Polytechnic Institute (RPI) here. In efforts to better prepare its graduates, RPI's School of Engineering is phasing out the time-shared use of its main computer, an IBM 3033, and phasing in its own Prime Computer, Inc. Model 500 interactive graphics system.

"Conventional time-shared computing has destroyed the intuition of a whole generation of American engineers," according to Dr. George Ansell, dean of RPI's School of Engineering.

Conventional computing, although it solves problems faster and with more accuracy, is lowering students' basic understanding of engineering concepts. Those concepts are developed by doing calculations by hand. Approximate solution techniques, which include trigonometric and exponential functions, exemplify such calculations, according to Ansell.

The solution to the problem, RPI decided, was to buy a $1.2 million interactive graphics systems. RPI theorized that if students could see how mathematical concepts affect an object, they would better understand those concepts and relate them to their chosen fields.

Mini in a Terminal

The system, which has been fully operational since January, uses two Prime 500 mainframes and 36 refresh interactive graphics display terminals with Imlac Corp.'s Fortran-based host graphics software package, according to Don Meagher, manager of interactive computer graphics at RPI.

"The host graphics package is a Fortran library of graphics calls. The package communicates with the dynagraphics system in the terminal. It's actually a 16-bit minicomputer inside the terminal," Meagher said.

The interactive graphics system is now open for use by the whole school. For two years the School of Engineering had been using another graphics system that limited its use to electrical, mechanical and civil engineering students.

"We tend to be heavily weighted to mechanical, electrical and civil engineering, but the others are coming on strong," Meagher stated.

In fact, the others may be coming on too strong for the 36 interactive graphics terminals.

"A year ago, we were worried we weren't going to have enough people using the system, and it would be something we had spent a lot of money on and it would be sitting there not being used."

Now, "our problem is not to get students to use it, but coping with the large number of users," Meagher said.

RPI doesn't have immediate plans to buy more terminals, he added.

Huge Backlog

Having only 36 terminals for more than 2,000 students sometimes created a backlog of users, Meagher said. However, keeping the center open longer during the end of the semester and when large projects were due minimized the problem.

"Seven hundred and twenty of the students were in a single course — a freshman course that's a two semester sequence. The first semester they learned Fortran on the 3033 mainframe. Then they came over here to learn graphics. That's a considerable percentage of our overall use," Meagher said.

Other uses of the system include large analysis programs, electrical circuit design, analysis of electronic fields, finite structural analysis, digital filter design, analysis of three dimensional linkages and modern control system design.

The interactive graphics system was also used for 30 master's, senior and research projects that included airfoil design, robotic arms and analysis of meltdown conditions in nuclear plants.

"Just about everything we do is in Fortran. We also have graphics in Basic. We don't typically encourage the use of Basic because it does not have a full complement of sub-

(Continued on Page 96)

Datapoint Introduces Printer For Smaller Installations

SAN ANTONIO, Texas — A 160 char./sec matrix printer designed for smaller DP installations is being offered by Datapoint Corp.

The Model 9621, equipped with a serial interface, can function as the system printer of the Datapoint 1500 dispersed processor or as a local or remote terminal for any of Datapoint's Datashare business time-sharing systems.

The Model 9622 is a parallel interface version of the 9621. It can be attached to the I/O bus of any other Datapoint processor to serve as a printer.

A microprocessor and buffer memory give the printers throughputs of up to 500 line/min using bidirectional printing and rapid head slewing, according to Datapoint.

With the upper or lower seven dots of the 9 by 9 matrix, the printers can produce lower case descenders and true underlining, Datapoint claimed.

A maximum copy width of 132 columns and edge-punched, fan-folded paper 1.5- to 15 in. wide are standard.

The printer automatically adjusts for forms thickness up to five copies. A manual thickness adjustment is also available.

The user can set line spacing at six or eight line/in. Vertical format control is set by the printer. A mechanical vertical format control is also available, according to the company.

Datapoint also offers optional dual-trackers to permit completion of two printing tasks at the same time.

The Model 9621 costs $2,495. The unit may be leased only in combination with a Datapoint dispersed processor.

The Model 9622 costs $2,745. It is available on a three-year leasing basis at $88/mo.

Datapoint is at 9725 Datapoint Drive, San Antonio, Texas 78284.

Printer Operates At 900 Line/Min

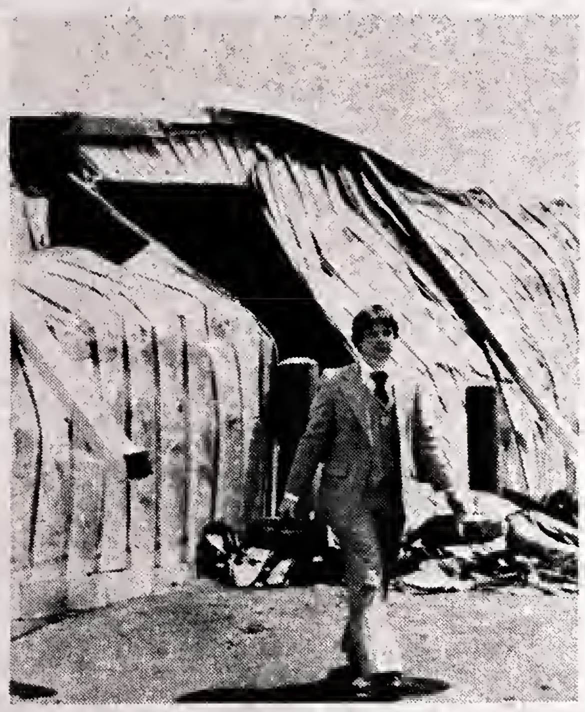
HORSHAM, Pa. — A 900 line/min IBM System/34-compatible printer has been introduced by Decision Data Computer Corp.

The Model 6609 printer is said to be the first printer with a rated speed over 300 line/min that is interfaceable to a System/34.

The entire 6600 series of line printers consists of six models ranging in speed from 200- to 1,500 line/min. The printers are interfaceable to IBM's System/3, System/360 and Series/1, as well as a number of minicomputers, a company spokesman said.

Purchase prices for the 6600 series System/34 printers range from $9,600 to $43,250. Monthly rental prices, including maintenance, range from $273 to $1,675, depending on the contract term and model selected.

Decision Data is at 100 Witmer Road, Horsham, Pa. 19044.



Disk-O Inferno

Although a recent fire at the Rattan and Bentwood Furniture Co. in King of Prussia, Pa., managed to destroy both the firm's inventory and its Basic/Four Corp. 610 minicomputer system, precious customer data was able to rise Phoenix-like from the ashes.

Basic/Four's Larry Thorpe salvaged two disks from the charred remains of the building. The disks had been stored in a fireproof safe.

Although the disks were scorched and sooty, the data was successfully played back at another site provided by the vendor.

Also destroyed in the blaze were seven CRT terminals and two printers, a Basic/-Four spokesman stated.

Mounts on or Beside Desk

Three-Module Mini Fits Into Crowded Area

LOS ANGELES — A three-module minicomputer designed to fit into a crowded work area is available from Compucorp, Inc.

The Model 655's CPU holds 48K- to 60K bytes of memory and accepts one or two disk drives, each storing 163,840 characters. The unit can be mounted on top of or beside a desk in a manner that will facilitate the changing of the diskettes, according to a company spokesman.

In addition, the unit's 12-in. CRT screen can be mounted on a wall or shelf and will accommodate 80 characters by 20 lines of display, the spokesman said.

The CRT screen is tiltable and was designed to prevent user fatigue following prolonged use.

The Model 655 comes with a full international character set and graphics capabilities, according to the spokesman.

A "typewriter-like" keyboard contains 20 program-definable keys and a full numeric cluster for entry of numeric data, he added.

Software for the 655 consists of application programs available from Compucorp or other sources. The Compucorp software includes extended Basic, a file management systems, sorting, assembler, text editor, debugger, linking editor and various device drivers.

The extended Basic package, which allows the user to create programs, provides interpretative or compiled operation, 12-digit floating-point processing, variable string length, multidimensional arrays, logical operators and assembly language calls.

Optional peripherals for expanding the 655 include typewriter-quality dot matrix printers and a hard disk.

The basic 655 system costs $5,400, Compucorp said from 1901 Bundy Drive, Los Angeles, Calif. 90025.

Disk Controller Acts as Interface Between Novas, Storage Modules

FULLERTON, Calif. — A disk controller acting as an intelligent interface between Data General Corp. Nova minicomputers and disk storage ranging from drives with 10M bytes of storage to storage modules with capacities of up to 300M bytes has been announced by Bytronix Corp.

The Model B448 can support up to four disk drives. And since the B448 is microprocessor-controlled, it may be microcoded for disks of various organization and capacities, a company spokesman said.

The unit features multiple record transfer with automatic advance over head and cylinder boundaries. Data transfer is achieved via the data channel.

Buffer Included

A 2,048-byte buffer is included, the spokesman said. Full error correction for up to 11-bit burst is automatic, as is error recovery, using the strobe and offset capabilities of the drives.

Either logical unit or direct block addressing is supported.

The B448 storage module controller was designed primarily for use with the Bytronix Series 2000 and 3000 computer systems and complements the B264/B364 CPUs and B064/B068 asynchronous communications multiplexers, he continued.

The B448 costs $2,995 with OEM discounts, the spokesman noted from 2751 E. Chapman Ave., Fullerton, Calif. 92631.

RPI Goes to Interactive Graphics

(Continued from Page 95)

routine calls, and it's also an interpreter, which eats up more cycles," Meagher said.

"For the freshman, who only had six hours on the machine, it was mostly weighted toward simple graphics commands. Each pair of students had to do an original program. The first group had to draw a clock, the second group a radio and the third a telephone."

Avoiding Congestion

Meagher said the 720-member class was divided into three groups to avoid congestion at the terminals.

The students "weren't making very sophisticated use of the terminals, because they were only guaranteed two hours a week for three weeks, or a total of six hours.

"That's the only class with which we enforced a time schedule because of its size. We wanted to pull that chunk of large students and dedicate it to one day.

"There were other courses that reserved terminals for set hours, but most of the time we encouraged random access to the facility.

"Our policy has been to guarantee the place will be open from 9 a.m. to 9 p.m. Monday through Friday, and 9 a.m. to 5 p.m. on Saturday. But typically, we don't close the doors at 9 o'clock if any of the staff members are there. During the end of the semester and when large projects are due, there's someone there around the clock," according to Meagher.

Although the Prime 500 system is being used extensively in engineering as well as in other departments, Meagher said it won't completely replace the IBM 3033.

"We are in the preliminary stages of planning a high speed network from the Prime to the 3033," he said.

The Prime 500 "doesn't have the same charter the 3033 facility does. It will tend to be more specialized than the main campus facility," Meagher explained.

Meagher added RPI is in the process of adding APL to the graphics system. Pl-1 and Pascal will be added in the future.

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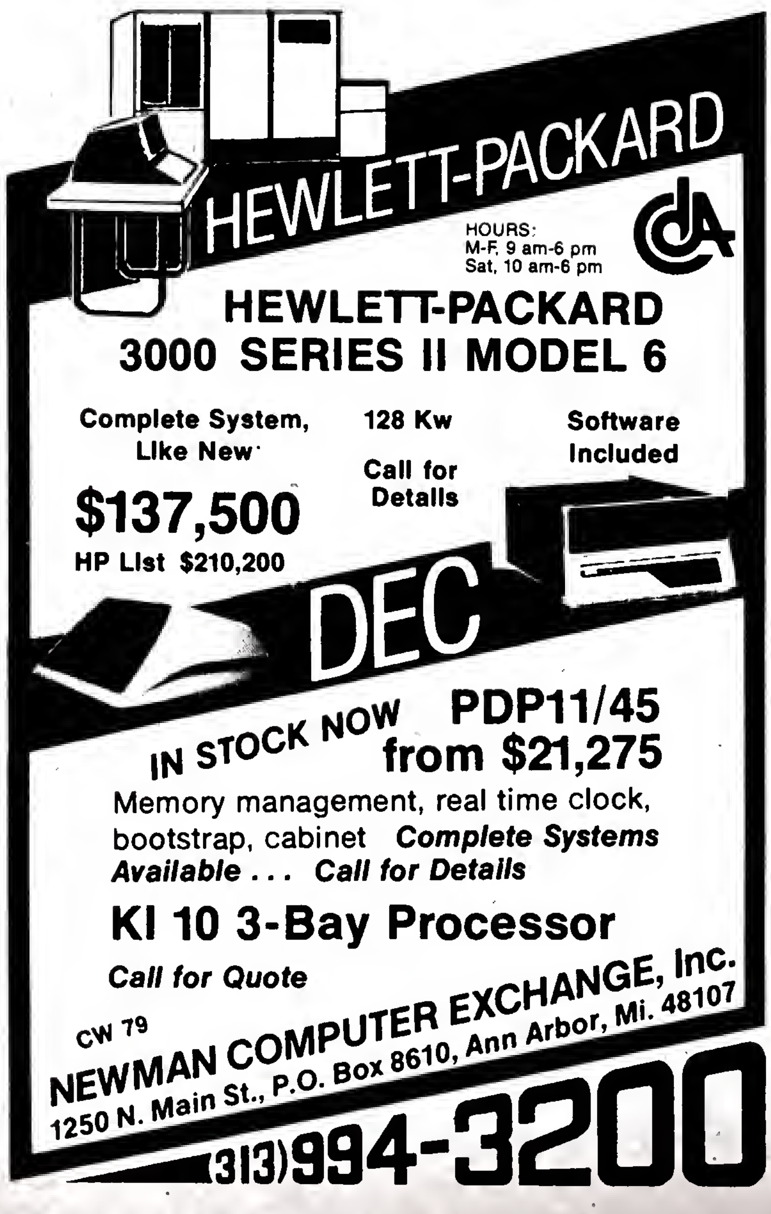
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From MDB Systems

Data Channel Controller Works With DG Eclipses

ORANGE, Calif. — MDB Systems, Inc. has introduced a direct memory access data channel controller for use with high-speed printers and Data General Corp. Eclipse computers.

The controller emulates the operation and programming features of the user's computer system and has an option that allows the use of differential line drivers/receivers.

This permits processor-to-printer operation over a distance of up to 3,000 ft, a spokesman claimed.

PIT/RTC Optional

The controller also has an optional switch-selectable programmable interval timer (PIT)/real-time clock (RTC). The PIT generates a program interrupt derived from a program-loaded 16-bit counter which is clocked at one of eight software-selected frequencies, the spokesman said.

The RTC mode generates interrupts at one of four program-controlled rates, he added.

The MDB data channel device is a single board using one slot in the computer chassis and is supplied with a 15 ft cable with mating connector to the specified printer. The unit costs $1,995 with delivery in 60 days from the firm at 1995 N. Batavia St., Orange, Calif. 92665.

WP Managers' Pay Jumped By 14%, Survey Indicates

WILLOW GROVE, Pa. — Salaries of word processing (WP) managers in the U.S. have risen 14% in the past year, according to the fifth annual salary survey results recently published by the International Word Processing (IWP) Association.

Using figures obtained from the 906 WP managers who participated in the survey, the association found that the 1979 average weekly salary — including regular bonus pay — is $357 as compared with 1978's average of $315.14 for an equivalent position. The survey also noted that WP supervisors now earn an average of $275.37, which is a 5% increase over last year's $262.95 figure.

One of the most notable increases over 1978's reported salaries for the U.S. was that for administrative support managers, which showed a jump of 23% — from $315.18 to $388.17, the survey said. In addition, staff analysts are now earning $394.98 per week, or 10% more than they did in 1978.

In contrast to American salaries, the survey pointed out that Canadian WP managers are earning approximately $329 per week (in U.S. currency); supervisors are collecting about $254; and staff analysts are being paid about $351 per week, Administrative support managers in Canada, however, are earning approximately $419 (in U.S. currency) per week, or nearly 10% more than their American counterparts.

The IWP Association's survey results reportedly reflect the salary data of 1,477 companies and 18,294 employees throughout the U.S. and Canada. The survey's average, high and low weekly salary figures cover 10 Zip Code and 19 metropolitan regions in the U.S. as well as three metropolitan regions in Canada.

The 1979 salary survey results are available for $20 to non-IWP members and for $10 to members from the association at 2360 Maryland Road, Willow Grove, Pa. 19090.

Debut Question Plagues Readers

By Brad Schultz
CW Staff

SANTA CRUZ, Calif. — The Beatles and computer data-storing cassette units debuted at about the same time in the U.S. — if a response to *Computerworld's* appeal for clarification on this subject is correct.

A small controversy began after CW ran a summary of Datapro Research Corp.'s "Minicomputer Cassette and Cartridge Magnetic Tape Units" [CW, May 21]. In speculating on the origins of what seems the most popular technology for storing data on small systems, the Datapro report's author suggested that "some scientist or engineer happened onto the idea one night about 10 years ago, quite by accident, while watching his teenager record a Beatles record."

But University of Tennessee professor Fletcher W. Donaldson sent in his recollection of a cassette product at the 1963 Association for Computing Machinery conference [CW, June 18].

Donaldson's memory seems at least as reliable as tape storage, for, according to James H. Haynes, associate development engineer with the University of California at Santa Cruz, "Scientific Data Systems had a cassette machine circa 1964, using an RCA-developed large cassette (1/4-in. tape, about 6 in. square).

"RCA gave up on this cassette format [at] about the same time," Haynes continued. "I remember seeing audio large cassette players being sold in surplus stores sometime during '63 to '66. The Scientific Data cassette feature was called Magpak, [which] I guess was an attempt to compete with [Digital Equipment Corp.'s reel-driven] Dectape."

Maybe that teenager was twisting to a Chubby Checker record.

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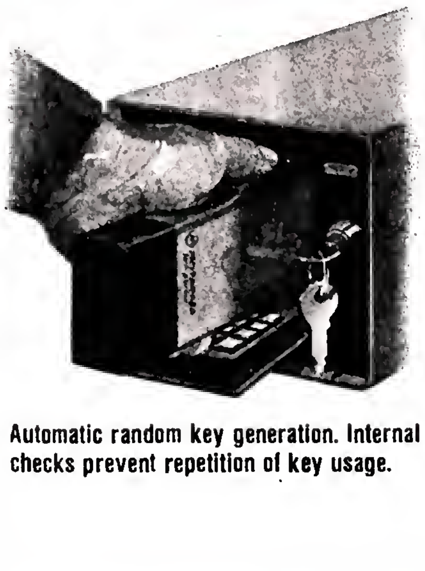
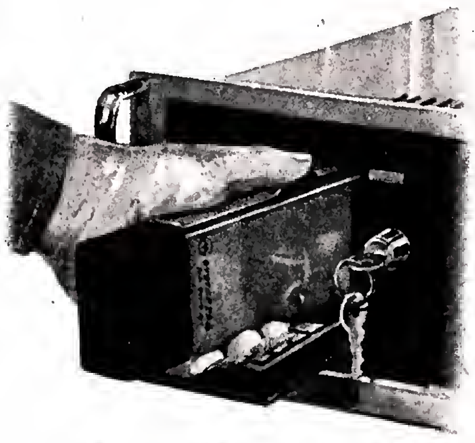


Automatic random key generation. Internal checks prevent repetition of key usage.



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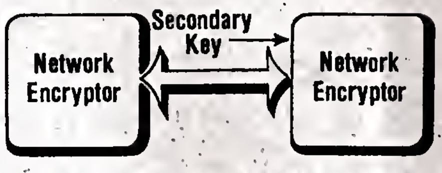

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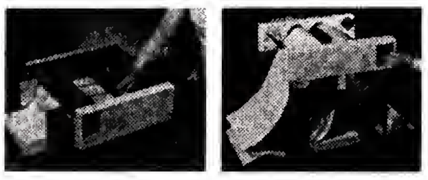

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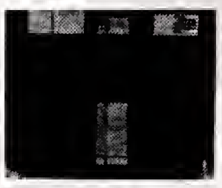

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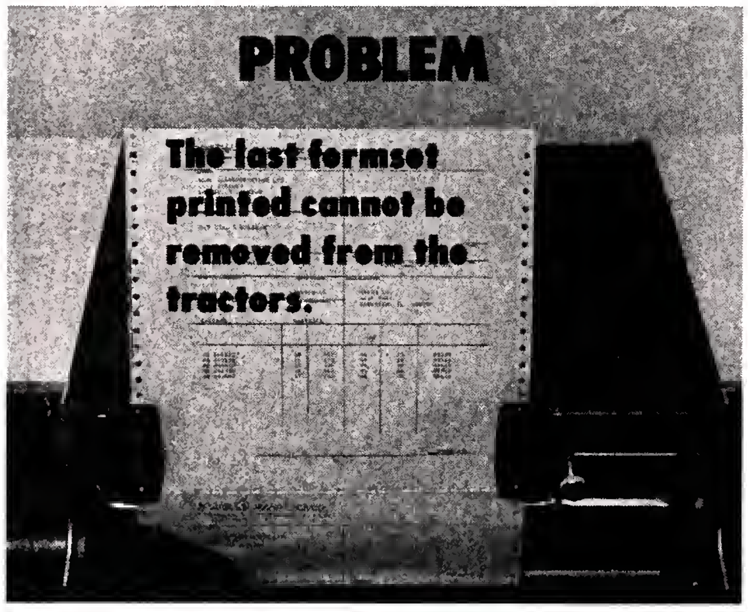
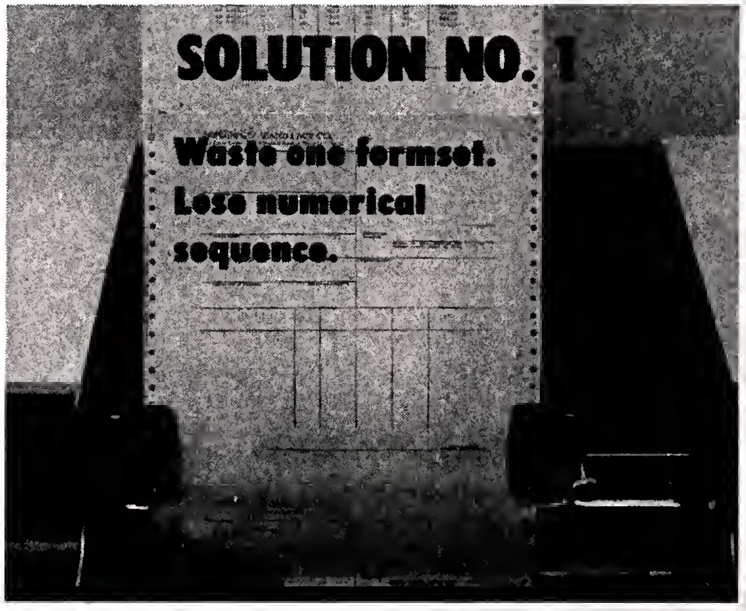
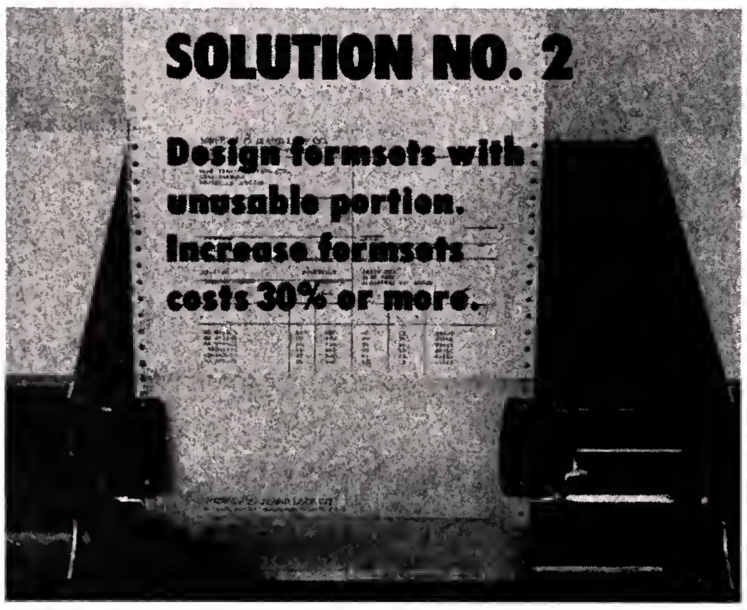
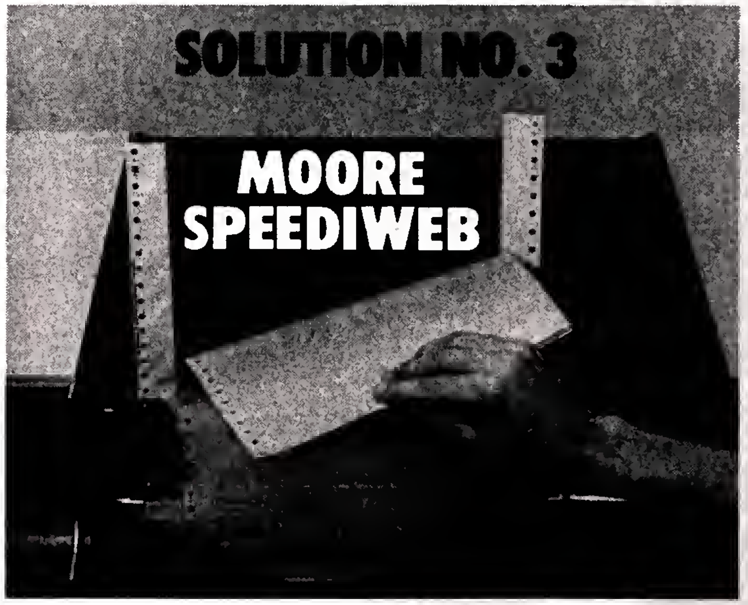

PROBLEM
The last formset printed cannot be removed from the tractors.




SOLUTION NO. 2
Design formsets with unusable portion. Increase formsets costs 30% or more.



Permits immediate removal of last printed formset with no waste, while margins remain in tractors to advance next one. Individual parts of the formset can be separated at any time after removal from the printer. An audit copy can be provided if desired. Available 3½" to 11" deep and 11" to 16" wide.

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With Leasing Deal

Firm Hikes DP Capacity Without Budget Strain

CHATSWORTH, Calif. — When sales and employment doubled within 12 months for a manufacturer of speciality computer printers and instrumentation here, the firm faced the problem of increasing its own DP capacity without enlarging its budget as well.

"We had an IBM System/3 Model 10 that we had leased in 1974 when we brought our bill of material work in-house from an IBM 360/20 at a service bureau," William Weaver, DP manager for Anadex, Inc., explained.

In order to have its own DP power, the firm decided to purchase the Model 10 by exercising its purchase credits.

While Anadex did not buy the non-IBM peripherals, it did add its own programs for accounts receivable, sales analysis, commissions, accounts payable and all its accounting journals, over the next three to four years. It also substantially modified IBM's Ipics inventory control system.

"But about a year ago I could foresee another crunch similar to the one we faced in 1974," Weaver said. He started looking for a cost-effective way to stretch his DP power without stretching his budget.

After investigating the major minicomputer manufacturers, Weaver decided the cost — in time and money — of software conversion to minicomputers would be too great.

Decided Against System/38

He also decided against waiting for a forthcoming announcement of IBM's System/38 because of his time crunch. Besides the fact that Weaver didn't know when the announcement would come, he felt the delivery lead times for newly announced IBM computers were "typically long" and he couldn't afford to wait.

"Being familiar with the System/3 family gave me an easier and cheaper way out," he said. "I knew I could do my own conversion, so my only real decision was whom to buy or lease from: IBM or a third-party leasing company."

Because Anadex owned its Model 10, Weaver wanted to make the sale of the older system part of the deal for his new one. "I sent out for quotes to a variety of leasing companies and their responses varied widely," he recalled. "One of the big ones never responded at all, while another was interested in leasing me a Model 15 but didn't want my 10 in trade.

"My ultimate choice came down to two third-party companies, one which would sell me a CPU and all non-IBM peripherals and another company called Amplicon, Inc. that would buy my 10 and lease me a complete IBM system."

The two price quotes were within $100 of each other for the monthly lease rate, Weaver said, but Amplicon was willing to buy his Model 10 for its book value — which just happened to be higher than the market value.

"Plus I figured I'd be better off with a 100% IBM system when I needed hardware service," Weaver said. "My desire for standard hardware and the simple fact that Amplicon's monthly lease rate was $1,500 a month less than IBM's for the same system turned me into a customer."The Model 15 was delivered last November and was a "bare bones" system with 128K words of memory, a pair of 3340 disk drives and one CRT terminal — just as Weaver ordered it and costing the same per month as his previous Model 10.

Conversion to the new system was accomplished in one weekend, Weaver said. Although Amplicon helped, the conversion was facilitated by the preparations Weaver and his small staff had made months in advance for the system's arrival.

Over the weekend, Weaver rented time from a service bureau to convert his 600 files for operation on the new

(Continued on Page 104)

Microstar Takes 4.8M Bytes

IRVINE, Calif. — An option that increases the disk capacity of Micro V Corp.'s Microstar business computer system to 4.8M bytes has been announced by the firm.

Available on four double-sided, double-density floppy disk drives, the additional storage increase by four times the system's original capacity of 1.2M bytes, a company spokesman said.

Microstar is a diskette-based system intended for such applications as accounting, word processing, order entry, inventory and communications.

Stardos Features

It features the Stardos multiuser operating system with Basic language support and Update, a data base management system and report writer.

A complete small business system with multiuser capability including a CRT terminal, a 1.2M-byte dual disk drive, 65K-byte random-access memory and 132-column line printer costs "less than $10,000."

The memory option costs $1,000.

Micro V Corp. is located at 17777 S.E. Main St., Irvine, Calif. 92714.

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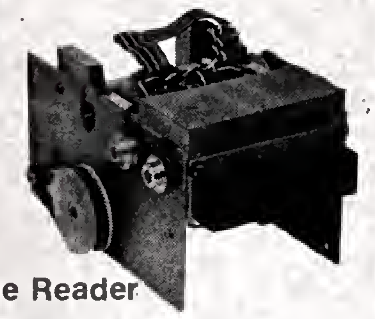

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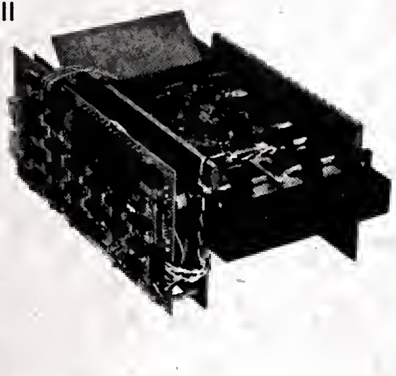

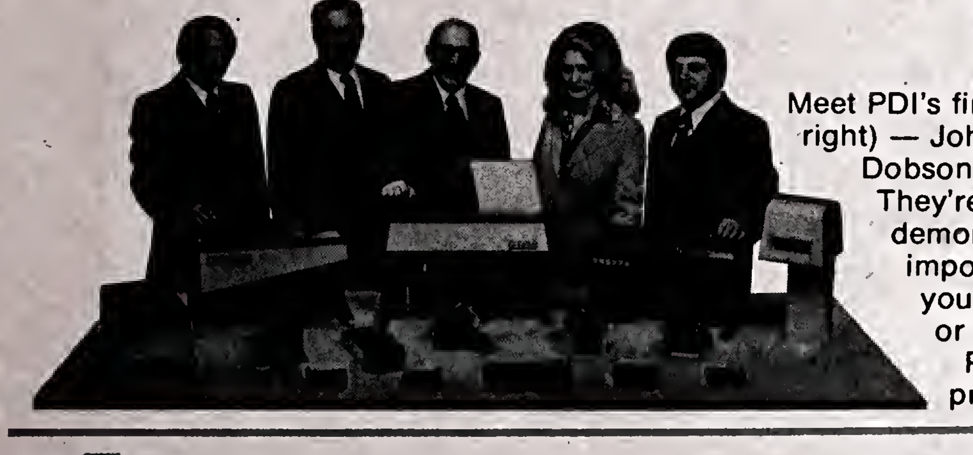

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CMD Drive Debuts for Harris' DDP Systems

DALLAS — Designed for large-capacity storage, Harris Corp.'s cartridge model disk (CMD) drive allows the firm's 1600 series distributed data processing (DDP) systems to be configured without magnetic tape drive backup.

The 1667 CMD device is composed of an 8M- or 16M-byte removable front-loading platter with two large-capacity fixed platters of 8M, 16M, 48M or 80M bytes for total capacities of 16M, 32M, 64M or 96M bytes, a spokesman said.

Because of the drive's ability to handle large volumes of data, files can be accessed locally, decreasing response time, reducing communications costs and minimizing the chance of network failure, he claimed.

Average random access time of the CMD is reportedly 30 milliseconds at a rotational speed of 3,600 rev/min and with an average latency time of 8.3 milliseconds. Data is transferred at a rate of 1.2M byte/sec.

Each recording surface on the CMD has a track density of 384 track/in. and data is recorded at densities of 6,038 bit/in., the spokesman continued. A dedicated, closed-loop, proportional servo system on both the cartridge and the fixed disks helps ensure the accurate positioning of the heads.

The DDP-oriented device includes microprocessor-control logic that features fault-monitoring and detection capabilities, and the CMD drive can be intermixed with Harris Winchester-type disks on the same controller. A total of eight disks with up to 768M bytes total capacity is supported on the 1600, the spokesman noted.

Purchase prices for the drive are: $13,575 for the 16M-byte model, $15,092 for the 32M-byte model, $23,672 for the 64M-byte model and $32,472 for the 96M-byte version. Monthly charges for a one-year lease are $343, $458, $673 and $913 for the 16M-byte through 96M-byte models, respectively.

Additional information on the CMD devices is available from Harris' Data Communications Division at 16001 Dallas Pkwy., Dallas, Texas 75240.

Color Graphics Offered to Users Of HP 2100 Series

CUPERTINO, Calif. — Users of Hewlett-Packard Co. 2100MX, XE and XF CPUs can now add high resolution to their standard color or black-and-white graphics display systems.

The Intermedia Systems, Inc. 4600 series resides in the host computer to simplify system integration. The display channel format is a 768 by 512 dot matrix, with between two and eight channels per system, according to the vendor.

In the Library

A bipolar microprocessor accepts high-level command sequences and generates graphic alphanumeric images. Microcode for the processor is stored in a graphics library, which can be expanded for specific customer functions, the vendor said.

Standard functions include vectors, areas, perimeters, multiple-sized characters, points and image readback. The readback facilitates hard copy with standard plotters, image repositioning, dynamic curves, data retrieval and image reversal.

A two-channel system costs $5,750, the vendor said from 10601 S. Saratoga-Sunnyvale Road, Cupertino, Calif. 95014.

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Prove Compatible Couple

Firm Finds Fertilizer, Mini Promote Growth

WILSON, N.C. — Computers and fertilizers may not sound like an ideal marriage, but according to 80 employees of the Lely Corp., the combination is working.

Lely, a farm equipment manufacturer, has introduced a 30-foot long gadget that sprays, tills, seeds, fertilizes and distributes growth-stimulating chemicals all in one pass. Creating innovative products helped, but according to the company head C. van der Lely, buying a computer system in 1973 was the first step in making his company a success.

Looking to better manage his plant, van der Lely was on the lookout for a small, cheap computer system. Up until 1973, his company used a service bureau to handle general accounting applications.

"We soon found the bureau made some basic accounting errors, and the turnaround in correcting these errors was great. When compared with the price a small business computer, the service bureau became very expensive, Lely's DP Manager Keith Hix said.

At that point, van der Lely decided it was time to buy a computer system. After talking with most major small business computer manufacturers, he purchased a Wang Laboratories, Inc. 2200B CPU.

In order to expand Lely's processing capabilities, while keeping its old equipment, the company purchased a Wang 2200C CPU and used the 2200B processor in a workstation environment.

By 1978, Lely underwent another expansion. The company now needed a multiuser to help manage the company.

"Luckily, Wang offered an upgrade kit allowing the 2200VP to become a 2200MVP multiuser system. We now own one 2200MVP processor with 128K bytes of usable memory; three 2236 inquiry terminals; two workstations, which were previously used as independent processors; 25M bytes of storage via two disk drive units; and four high-speed printers," Hix said.

Variety of Tasks

The 2200MVP now handles production planning, inventory control, credit checks, parts control, system control planning, company payroll and rates the sales force's effectiveness. The company developed all the software for the system itself.

"Most of my clerical help had never seen a computer before," Lely Vice-President and General Manager Peter van den Berg said. It took about two weeks to teach six clerks to perform data entry and simple business calculations on the system, he added.

The 2200MVP inventory control program helps Lely save money and includes a forecasting program that helps the company buy more accurate quantities of raw materials. "We've been pretty accurate up to now," van den Berg said. As for the sales evaluation program, it has reportedly increased productivity, profits and salesmen's income.

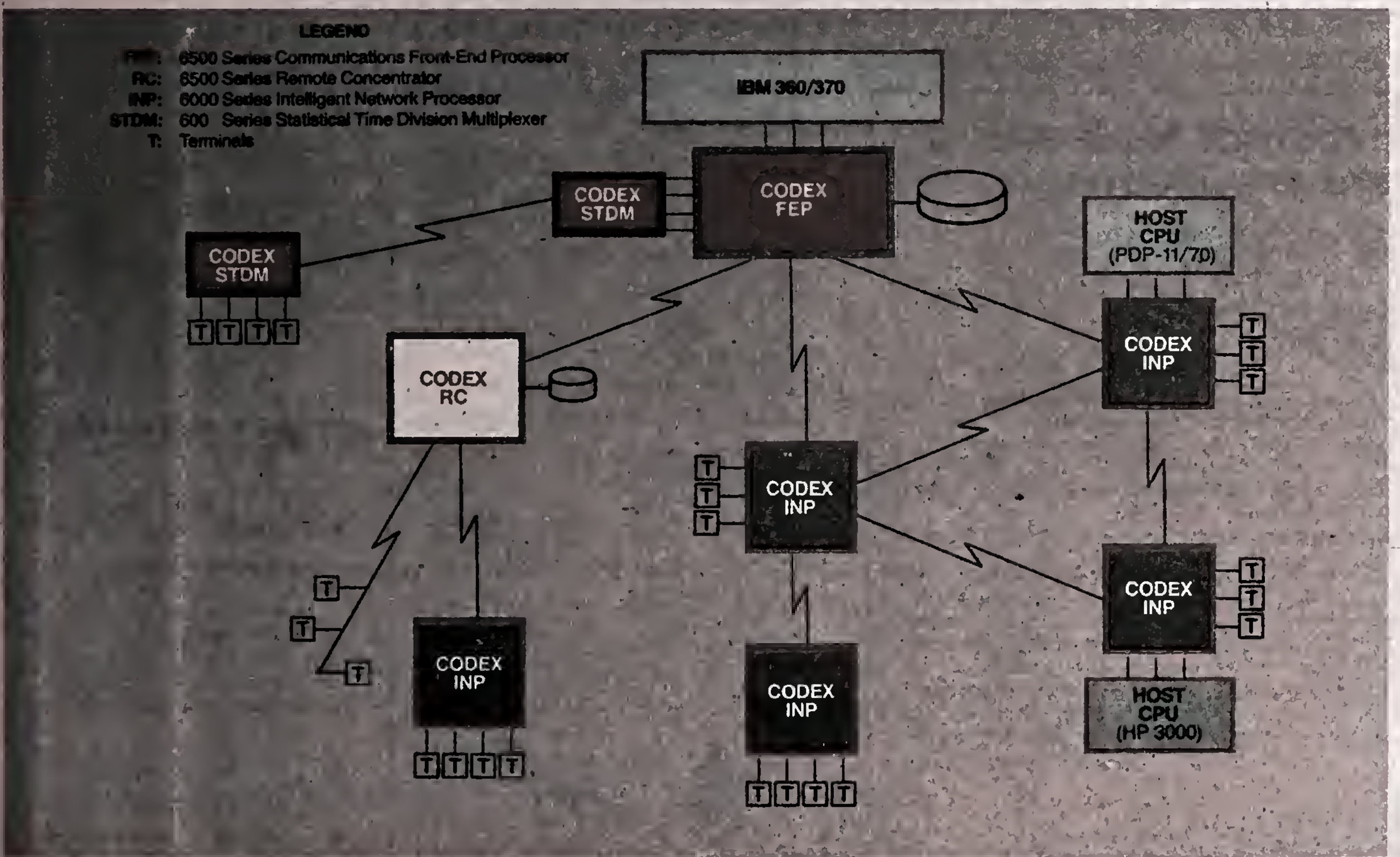
Back on Track

Lely has owned the 2200MVP system for more than a year and is thinking about expanding again.

"We're in the process of looking at some possible upgrades right now. We may add a couple of terminals, some memory block, another printer and a disk drive.

ID

UTER.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Manufacturer Boosts DP Capacity Without Enlarging Its Budget

(Continued from Page 101)

system.

"We came in on Monday morning with all of our data files on two disk packs and all of our programs on another pack," Weaver said. "All we did was pull our programs over into our data file packs, do an initial program load and we were off and running.

By 9 a.m., the system ran as if it were our Model 10, but a lot faster," he added. "We had a few little problems with some procedures — files in the wrong pack and things like that — but we weren't down at all. We didn't lose one bit," he said.

With the Model 15 up and running, it wasn't long before Anadex management realized it had underestimated how much it would use the new system.

"When we went up with the CRT, the demand for computer programming and new applications skyrocketed," Weaver noted.

"All of a sudden I was under-computered again, but this time it was a good problem. We were providing things our people had never had before and they wanted more of them."

Series of Upgrades

In a series of system upgrades, Weaver went from 128K- to 192K words of memory, increased the number of terminals from one to nine and then, in April, faced the task of computerizing a new facility across the street.

"The company was bursting at the seams," he said. The new office necessitated adding a bisynchronous controller and a 3271 controller so Anadex could add a CRT in the new building.

"With all of these new users and programs, we had to add another pair of 3340 disk drives as well as a 3411 Model 1 tape drive as a back-up storage medium," he added.

The end result for Anadex has been a system that Weaver feels will meet the firm's needs for another three to five years.

"We have about 1,000 programs running now, involving accounts receivable, accounts payable, payroll and our Ipics system," Weaver said.

"Ipics, involving our bill of materiel system, product costing, inventory accounting, shop floor control and other related systems, probably represents about 50% to 60% of our computing load," he noted. "The remainder is financially oriented and we've reserved one partition for our programmers."

Weaver is currently aiming at moving more operations from a batch environment to on-line service. "With my disks and my CRTs, I can really pump the work out and people can see that the reports they're getting aren't two days old anymore," Weaver said.

By the end of 1979, he hopes to have an on-line order entry system. When the Model 15 reaches capacity, Weaver concluded, "I may add a second Model 15 if the price is right and split the work between an on-line Ipics system and an on-line or batch financial system."

Nova Given to College

ABINGDON, Va. — Data General Corp. has donated a Nova 3/12 minicomputer system to Virginia Highlands Community College here for use in the school's computer technician training program.

Valued at more than $40,000, the computer will be used by electronics majors who are working toward an Associate in Applied Science degree in industrial technology. Students will receive instruction in technical troubleshooting in several programming languages, according to a DG spokesman.

Included in the donation is nine weeks of technical courses at the computer manufacturer's training center in Dallas, Texas, which will be attended by the school's electronics instructor.

Mini-Floppy Drive Unveiled by Digicom

SAN JOSE, Calif. — A microprocessor-based mini-floppy disk drive is available from Digicom Data Products, Inc.

The Digidisk emulates magnetic and paper tape and allows the operator to prepare and edit messages on or off-line. The unit will operate with any printer or CRT terminal through the RS-232C interface, Digicom claimed.

The Digidisk responds to a remote control code and can be used for data storage, automatic send/receive program loading and customer-oriented data collection applications. It uses a "mini disk" with a 73K-byte memory. Software controlling the Digidisk is stored on disk rather than in the circuitry.

The Digidisk sells for $1,495 with the standard interface and for $1,595 with a built-in 300 bit/sec originate-only coupler.

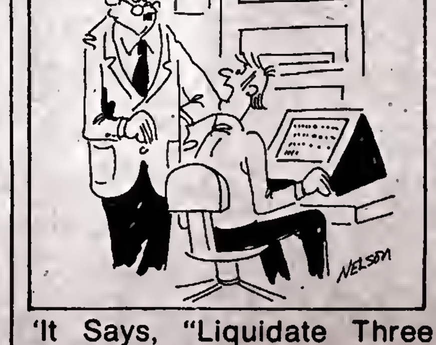
Digicom Data Products, Inc. is at Suite 108, 1440 Koll Circle, San Jose, Calif. 95112.

Catalog Lists Inmac Line

SANTA CLARA, Calif. — Covering everything from magnetic media to computer room furniture, Inmac Corp.'s "Summer '79" catalog includes products designed for minicomputer and word processing system users.

The 70-page catalog also features nearly 200 recent additions to the firm's product line such as a double-shielded IEEE interface bus cable; a "paper taxi" that wheels paper to and from the printer; and a fortifying kit that reinforces both standard flexible disks and minifloppies.

The catalog plus a one-year subscription for future product publications is free from Inmac, Department A003, 2465 Augustine Drive, Santa Clara, Calif. 95051.



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From Games to UPI Reports

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McLEAN, Va. — Microcomputer users can now obtain data on more than 2,000 programs and data bases ranging from computer games to United Press International (UPI) news reports through Telecomputing Corp. of America's (TCA) Source telecomputing network.

Called the first nationwide information utility for use by the general public, the Source can be used to access airline schedules, make travel reservations and order tickets. Users can run their biorhythms, take a wine appreciation course, buy and sell real estate, or prepare their income tax returns through Source.

A nationwide restaurant guide will also be provided, and small business applications are available with the network.

Users can obtain UPI reports on their own home or business microcomputers just seconds after they come over UPI's own wires.

Information from the service, known as Newshare, is transmitted from UPI's wires to users by TCA. Users can connect with TCA's system in Silver Spring, Md., via a Tymnet, Inc. or Telenet Communications Corp. service, using their own telephone as the communications relay.

Upon request, TCA's time-sharing system will retrieve the desired information from its data base and transmit it to the user's microcomputer.

Secret Passwords

The user can access the service through an identification number and a secret password. Users can obtain information on a national, regional, state or local level, and the data can be broken down into categories including general news, business, sports or financial. The user selects a key word, and the system provides all the necessary information on that topic.

The system was designed to hold a month's worth of information on any topic. It can also be used in a ticker tape mode for studying the daily news.

It costs $100 to register for the total network. During prime business hours, it costs an additional $15/hour of connect time, including the cost of the phone call. From 6 p.m. to 7 a.m. daily and on weekends and holidays, an additional hour of connect time, again including the cost of the phone call, is $2.75.

Programming languages include Fortran, Cobol, Extended Basic, RPG and assembly language. Any microcomputer equipped with a 300 word/min telephone interface can access the system.

In addition, any Source subscriber can use the electronic mail system to communicate with any other subscriber, regardless of the make or model of his terminal or micro.

The Source features both store-and-forward mail capability, as well as the ability to communicate interactively. Electronic mail to the outside world is provided via Datapost, and messages can be left for other subscribers from any telephone.

More information on Source is available from TCA at 1616 Anderson Road, McLean, Va. 22102.

Apple Updates Program Bank, Collects Software Routines

CUPERTINO, Calif. — Apple Computer, Inc. has introduced a collection of system software routines for disk-based Apple II computers, as well as a number of user-contributed programs.

The Disk Utility Pack programs include Version 3.2, the latest release of the Apple II disk operating system; Update, which upgrades the existing disk operating system on any diskette to Version 3.2 without disturbing any other programs; Applesoft Chain, which allows one Extended Basic program to run a second without losing data defined by the first; and Renumber/Merge, which renumbers and combines several Extended Basic routines into a single program.

Available from any Apple dealer, the Disk Utility Pack includes a system master diskette and blank diskette for the 3.2 version of the disk operating system. The pack costs $25.

Software Bank Releases

In addition to the Disk Utility Pack, Apple has released volumes three through five of the Apple Software Bank, a library of user-contributed programs. The programs include File Cabinet, a personal directory and recordkeeping system; Character Generator, a program for labeling high-resolution graphics images; California Driver's Test, a simulation of the actual exam; Integer Basic Renumber/Append; and 25 others.

In addition, the firm is offering a 90-page manual providing detailed descriptions of and operating instructions for each of the programs.

Apple is also offering Apple Bowl and Microchess, two graphics-oriented games.

The user-contributed programs from the Apple Software Bank are available from any Apple dealer. Users must provide their own blank diskette or cassette tape for copying the programs.

A copy fee of $10 per diskette or $2 per program will be charged. The manual is free with the purchase of any or all of the programs.

Microchess costs $20 on cassette tape and $25 on diskette, and Applebowl costs $20 on tape and disk.

Apple Computer is headquartered at 10260 Bandley Drive, Cupertino, Calif. 95014.

Micro Bytes

Teaching Program Ready for Apple II

LOS ANGELES — Creative Discount Software is offering a teaching program for the Apple Computer, Inc. Apple II computer's Microsoft Basic.

The program is available on disk and can be operated without the use of a detailed textbook, the firm said. Examples of operating programs and a glossary are provided.

Called the Floating-Point Dictionary, the program costs $35. The firm's catalog of more than 75 programs is available from P.O. Box 24-B-67, Los Angeles, Calif. 90024.

Micropolis Mod II Gets Property Management System

CHICOPEE, Mass. — Custom Electronics, Inc. has introduced a property management system for use with the Micropolis Mod II.

The software performs the routine daily posting of information to the user's accounts. The system is supplied with five standard reports important in property management, according to the firm.

The program costs $69.95 from Custom Electronics at 238 Exchange St., Chicopee, Mass. 01013.

Speechlab Users Group Formed

LOS ALTOS, Calif. — Heuristics, Inc., manufacturer of Speechlab, a speech recognition unit for the Apple Computer, Inc. microcomputer and all S-100 bus computers, has announced the formation of a users group.

Interested Speechlab users can contact Tom Larson, sales director at Heuristics.

Questions or reports of innovative uses of the hardware and software can be sent to the firm at 900 N. San Antonio Road, Los Altos, Calif. 94022.

Terminal, MPU Combined

ANN ARBOR, Mich. — NCE/Compumart, Inc. has combined a microprocessor and a terminal into one unit and is offering it to users for about the same price as a microcomputer alone, the firm said.

The TC 2001 combines the Commodore Business Machines, Inc. Pet and NCE's company-designed terminal for a total of 8K- or 16K bytes of random-access memory (RAM) and a cost of $795.

The unit functions as a full-duplex dumb terminal that can be used in conjunction with remote time-sharing services, according to the firm. It can also be used as an advanced personal computer.

As a terminal, the TC 2001 works at a rate of 300 bit/sec. It accepts an RS-232 interface and puts out TTL voltage. It has both upper and lower case characters as well as graphics on the 40 character by 25 line CRT display.

More information is available from NCE/Compumart at P.O. Box 8610, Department P1, Ann Arbor, Mich. 48107.

TRS-80 Gets Color Graphics

SASKATOON, Canada — JFF Electronics, Ltd. has introduced a high-resolution color graphics interface for TRS-80 owners.

Aimed at the hobbyist, the board's operating modes are software-selectable. The high-resolution mode can display a 128 by 192 matrix in one of two sets of four colors or can be traded off to 256 by 192 maximum resolution in two colors. In lower resolution, modes of up to eight colors are available.

The printed circuit (PC) board has its own regulated on-board power supply and connects directly to a TRS-80 keyboard. No expansion interface is required, according to the firm.

The PC board can be used with Level II Basic PEEK, POKE and OT commands or Level I Basic using TBug. It can also be used with the machine language routines generated with the TRS-80 Editor/Assembler.

The PC board costs $49.95 from JFF Electronics, 001 CN Towers, Saskatoon, Canada S7K 1J5.

Inventory Control to Dow Jones Watching

Apple Unveils Four Programs for Business

CUPERTINO Calif. — Apple Computer, Inc. is offering four business software programs called The Cashier, Apple Post, The Dow Jones and The Controller.

The Cashier is an inventory control and cash register simulation system that eliminates work filling out lists and forms, the firm said. When a customer account is entered, the information is automatically used to generate sales receipts, billing records, mailing lists and accounting summaries.

The program can process back orders, down payments and funds, managing an inventory of more than 800 stock numbers. It requires 48K bytes of random-access memory (RAM), dual disk drives and Applesoft Basic and costs $250.

Apple Post

The Apple Post is a data base system that handles the creation and maintenance of mailing lists, allowing the entry and editing of names, addresses and phone numbers. It can print lists of labels in order by name or Zip Code, and up to 500 names can be contained on each floppy diskette.

Apple Post comes with a manual and diskette and requires 48K bytes of RAM, dual disk drives, Applesoft Basic and a printer and costs $49.95.

The Dow Jones series consists of the Stock Quote Reporter and the Portfolio Evaluator, both of which require 32K bytes of RAM and Applesoft Basic.

The Stock Quote Reporter allows Apple to hold a list of stocks and continually update bid of opening prices, asking or closing prices, daily highs and lows and the current volume of the stock. All data is available — with a 15-minute delay by local phone to the Dow Jones Service.

The Portfolio Evaluator can maintain up to 50 stock portfolios on a floppy diskette, analyzing each to provide summaries of short- and long-term gains and losses, current values and shares held. The system costs $50.

The Controller

The Controller software package is a modular system designed to handle the needs of small businesses grossing between $100,000 and $1 million in sales annually.

The Controller is said to allow businesses to control revenues and expenses through general ledger, accounts payable and accounts receivable. Designed for a nontechnical manager or clerk, the program supports either cash or accrual bookkeeping.

It is available separately or as part of a new business configuration, the Apple Plus business system. Alone, it costs $625.

Apple headquarters is at 10260 Bandley Drive, Cupertino, Calif. 95014.

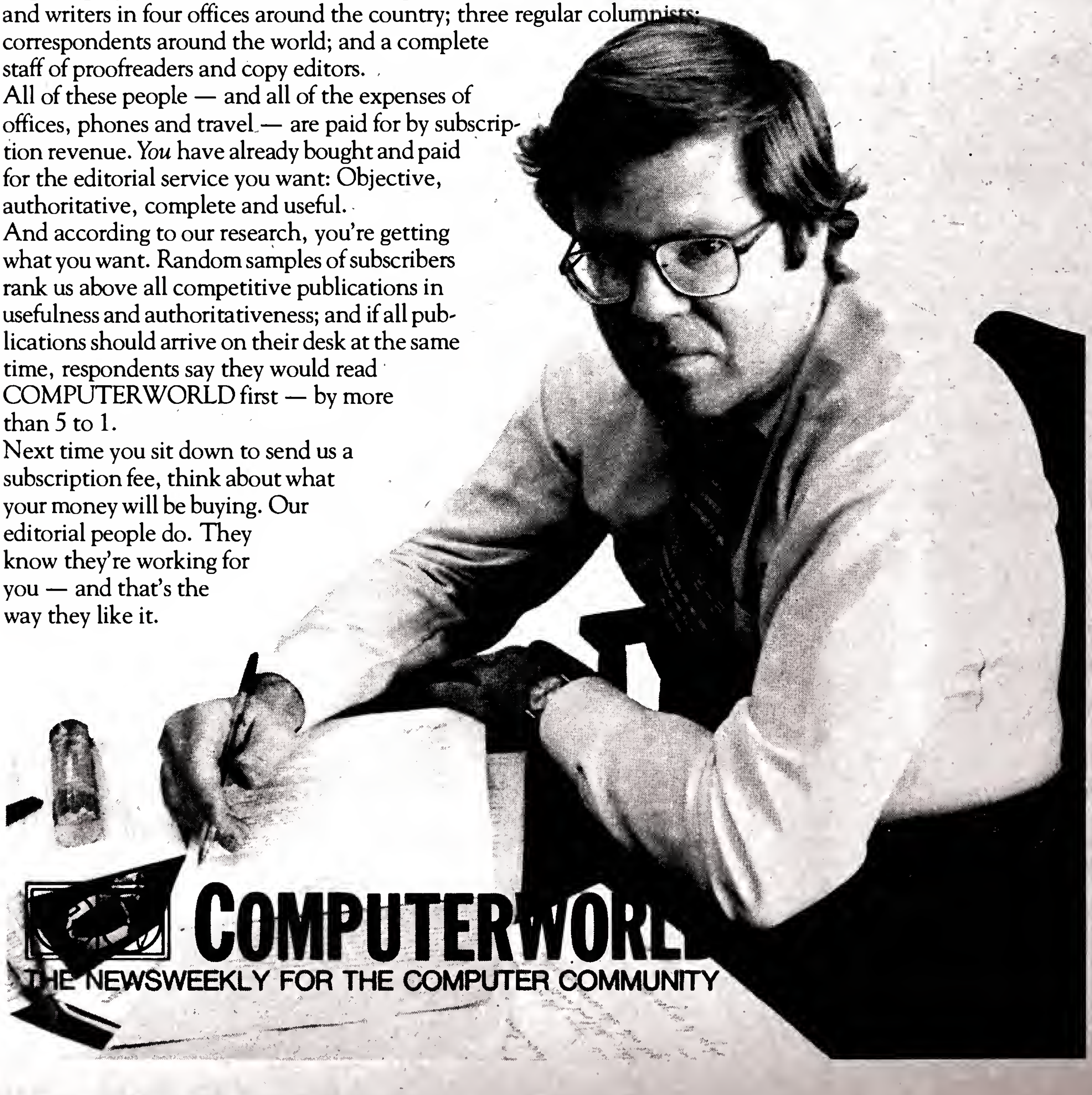
Apple Assembler Incorporates Text Editor

REDONDO BEACH, Calif. — The Microproducts, Inc. Apple II Six-Character Editor/Assembler for the Apple Computer, Inc. microcomputer incorporates provisions for calling any printer driver from any location in memory, including, read-only memory (ROM), random-access memory (RAM), programmable read-only memory (Prom) or erasable programmable read-only memory (Eprom).

The unit is available on either Apple II-compatible cassette tape or floppy diskette and incorporates a text editor. Code can be assembled at more than 3,000 line/min.

The text editor operates in two entry modes, data entry and command mode. When data lines are entered, a syntax check is performed on each input line, which is then stored in the text file.

The editor/assembler, with instructions, is priced at $34.95 on cassette. On diskette, it costs $38.95 from local retail stores or from Microproducts, 2107 Artesia Blvd., Redondo Beach, Calif. 90278.



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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Family of Memory Modules Unveiled for DEC LSI-11

PALO ALTO, Calif. — Digital Pathways, Inc. has introduced a family of memory modules for the Digital Equipment Corp. LSI-11.

The modules are all bank-switchable, allowing for almost unlimited expansion of the available memory space, the firm said. At the same time, individual memory modules, when operated in their "local" modes, are fully hardware- and software-compatible with standard DEC memory.

The family is comprised of two dual-width memory modules and a dual-width controller module. The first of the memory modules, the RMA-032, is a 32K-byte by 16-bit random-access memory (RAM) system using the industry-standard 250 nsec 16K-byte dynamic RAM circuits, along with on-board distributed refresh. When the RMA-032 is used alone, only 28K words are accessible to the CPU.

RMS-016 Capabilities

The second memory module, the RMS-016, is a 16K word read-only memory (ROM) board making use of Intel Corp.'s 2716 erasable programmable read-only memory (Eprom) or equivalent ROMs. When used by itself, any 4K word block can be assigned to any sector of memory space by means of a wire jumper.

The key to the bank-switching system lies in the third Q-bus-compatible module, the BSC-256 bank switch controller, the firm said. Each of the individual memory modules may be put under the control of the BSC-256 by moving an on-board switch and connecting a daisy-chained cable. Each BSC-256 is then capable of handling up to 2M bytes of RAM or ROM in any desired combination.

Bank-switching is done with a set of device registers on the BSC-256. Each of these registers determines which one of 256 independent 4K blocks of physical memory is assigned at any instant to a given 4K sector of address space.

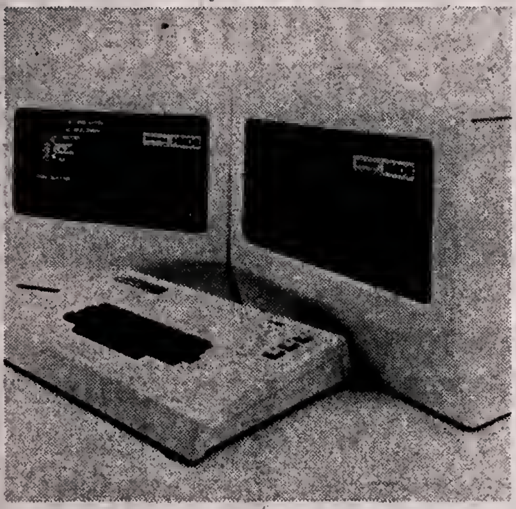
The RMA-032 module costs $1,200, the RMS-016 costs $300 — without Eproms — and the BSC-256 costs $300 from the firm at 4151 Middlefield Road, Palo Alto, Calif. 94306.

MPU Development System Suits 1802-Based Micro

NEWPORT BEACH, Calif. — A microprocessor development system that allows the development of hardware and software for the 1802-based CMOS microprocessor has been introduced by Hughes Aircraft Co.'s Solid-State Products Division.

The development system, consisting of an integrated hardware and software package, is available with floppy-disk storage or in a tape version.

The unit was designed to provide the needed controlled hardware interface of 1802 microprocessor-based systems, along with software development capability.



The Hughes Microprocessor Development System

Basic Hardware

The basic hardware consists of a CRT, an Ascii keyboard, 16K bytes of static random-access memory (RAM), an in-circuit debugger board for the 1802, a master Z80 processor and I/O handler board, serial and parallel I/O ports and power supplies.

Data is stored on either dual 8-in. double-density floppy disk units with 1,018K bytes of storage, dual 5-in. quad-density minifloppy disks with 630K bytes of storage or dual-tape cassettes with approximately 100K bytes of storage.

The 1802 in-circuit debugger card can be used to execute generated programs for checking the integrity of the software. The card can also be used to monitor and control prototype hardware. Programs can be executed from the memory residing on the proto board or through memory within the development system.

Prices for the microprocessor development system range from $7,000 to $11,000, depending on the type of data storage and options selected. Hughes Solid-State Products Division is at 500 Superior Ave., Newport Beach, Calif. 92660.

Core-Resident Monitor Out

LEDGEWOOD, N.J. — The EASZ80 monitor from Electro Analytic Systems, Inc. (EAS) is a 1K core-resident monitor designed to provide a flexible "software front panel" for Z80 microcomputer systems lacking a front panel, according to a spokesman for the company.

The EASZ80 monitor provides the ability to stop or start the front panel display by striking any key but the return key. It also provides memory display, memory alter, memory movement, memory compare and I/O port query capabilities.

With the standard monitor-paper tape, the cassette or disk version costs $30. The 1K version, burned into a 2708 erasable programmable read-only memory (Eprom), costs $50, and the 2K version, burned into a 2708 Eprom, costs $70.

EAS can be reached at P.O. Box 102, Ledgewood, N.J. 07852.

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Acquires Informatics Products

SDA Moving Into IBM Software Market

By Connie Winkler
CW Staff

NEW YORK — Software Design Associates, Inc. (SDA) has acquired its second software product line to position itself for the new day of telecommunications and 370-compatible systems.

SDA President Jay N. Goldberg recently announced the acquisition of the Intercomm and Minicomm products from Informatics, Inc. of Woodland Hills, Calif. This comes on the heels of SDA's takeover in March of Software Systems Corp. of McLean, Va., and its main product, Dimension V.

This marks the beginning of a product line for SDA, which until now has only offered software services. A wholly owned subsidiary, SDA Products, Inc., has been formed to market the products.

Dimension V and Intercomm, supplemented by SDA's 250 software professionals, should make the right combination to launch SDA into the IBM 4300 generation and the next decade, according to Goldberg. "Ten years from now, we want to be positioned as one of the major firms providing software and professional services," he said.

In its first 10 years, SDA has provided a gamut of information processing services to 100 banking, utility and insurance companies in the Fortune 500. Still privately owned, SDA started with three founders in 1968; by the end of 1979, it will have 300 employees and sales of $14 million.

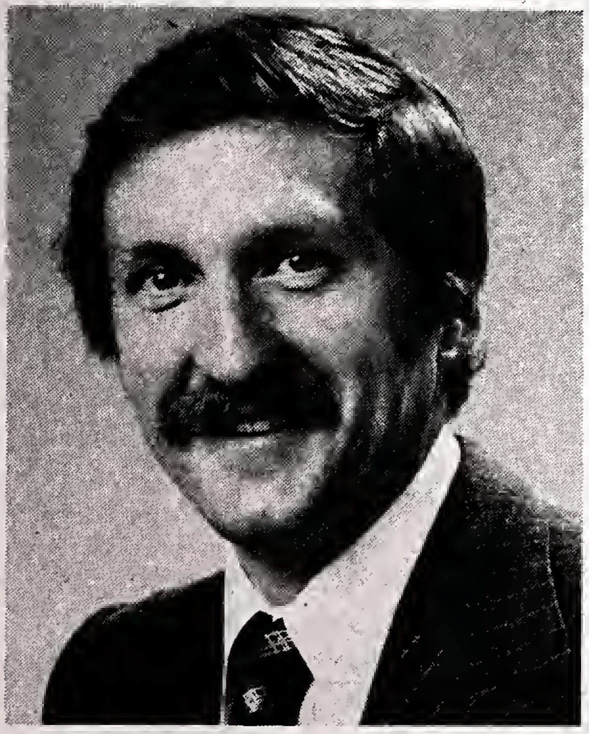
Rival of CICS

"We feel there is a lot of opportunity in communications," Goldberg said about the purchase of Intercomm and Minicomm. "This was our opportunity to get into communications software, and we jumped at it."

Intercomm, a head-on competitor with IBM's Customer Information Control System (CICS), is one of the oldest, tested telecommunications monitors used primarily with large networks. "It's really a quality product which Auerbach Publishers, Inc. rated higher than CICS," the SDA president claimed.

SDA sees Intercomm and Minicomm as the start of a large software line for big users of data communications. Minicomm is a DOS teleprocessing monitor that reportedly allows small DOS shops to have on-line systems up and running in one day. Minicomm could become the basic product of SDA's software product line for small distributed processing systems.

The 30 employees involved with Intercomm and Minicomm will be incorporated into the SDA staff, as have the 10 from Software Systems Corp. SDA acquired Software Systems Corp. in March because


Jay N. Goldberg

(Continued on Page 118)

Hitachi: 'No Plans' To Buy Itel Group

By Connie Winkler
CW Staff

NEW YORK — Hitachi, Ltd. has "no plans" to acquire Itel Corp.'s sagging Data Products Group.

Masafumi Misu, Hitachi senior executive vice-president and director, admitted the company had talked with Itel about the troubled computer division. Misu made that statement at a press conference last week announcing record sales and earnings for the year ended March 31.

Hitachi's 40 subsidiaries had net sales of $12.3 billion, up 8% over the $11.3 billion for 1978. Earnings increased 25% to $462 million compared with $371 million a year ago.

A big share of those increases came from computer sales, which increased by 19% to about $1 billion, Misu said, making Hitachi the third largest computer manufacturer in Japan behind IBM and Fujitsu. Hitachi's Japanese market share is about 17%.

Hitachi is the only Japanese manufacturer with a large-scale computer rental base, the firm claimed. Rentals now account for more than 40% of total sales, Misu said.

He also reported Hitachi's 64K random-access memory is scheduled to go into mass production early in 1980. Hitachi is investing large amounts of capital and human resources in semiconductor research and development.

Last year Hitachi opened two semiconductor plants: Hitachi Semiconductor (U.S.A.) in Dallas and Hitachi Semiconductor (Hong Kong).

Although Hitachi is exploring the Chinese market for all its products, it is already selling computers there. Hitachi shipped five M series computers for China's weather information and geological survey systems last year.

In February, Hitachi opened an office in Peking, making it the first Japanese company, other than a trading company, to establish a marketing presence in China.

Japan Agrees to Slash Tariffs Over a Period of Eight Years

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Agreement by Japan to sharply reduce tariffs on computers and semiconductors has been reported by the U.S. government as a result of the latest round of international trade negotiations.

The Japanese tariff reductions are the most dramatic to emerge from the so-called "Tokyo round" of trade talks, which has led to tariff cuts by all the major Western trading partners.

At the end of a gradual, eight-year reduction process, Japanese tariffs will be 4.9% for mainframes and 6% for memories and other peripherals. Before the negotiations began, the tariffs were 15% and 25%, respectively.

The U.S. will lower its 5.5% tariff to 3.9%, a move that is being matched by Canada. The European Economic Community (EEC) will peg its final tariff at 4.9% for CPU's, but the EEC tariff for semiconductors will remain unchanged at 17% — in line with European efforts to stimulate native semiconductor industries.

Except for the Japanese cuts, industry observers feel the tariff agreements will only marginally affect the level of U.S. exports of computers and integrated circuits. EEC tariffs were not very high to begin with, and Canada imports almost 100% of its computer equipment.

Along with the EEC posture on semiconductor tariffs, there were other disappointments in the Tokyo talks. "Our members are very disappointed that we weren't able to achieve more with the developing countries," Oliver Smoot Jr., vice-president of the Computer and Business Equipment Manufacturers Association, told *Computerworld*.

Many developing countries — some of

(Continued on Page 116)

UK Firm Establishes U.S. Arm Set to Sell to DEC OEMs

By Marcia Blumenthal
CW Staff

MANCHESTER, N.H. — The UK's Gamma Computer Group, one of Digital Equipment Corp.'s largest OEM customers, recently established a company here with the twofold purpose of acting as a traditional DEC OEM and as a wholesaler to other DEC OEMs.

Headed by Patricia A. Colbert, formerly a DEC market development specialist, Gamma Computer Corp. will serve as a commercial OEM selling to end users within radius of about 40 miles of Manchester. To that end, Colbert has already hired a sales manager and is in the process of adding a systems analyst and a couple of programmers to the staff.

In its startup phases, Gamma will concentrate on developing local business. Within the next six months, however, Colbert anticipates using the parent company's resources to establish a national marketing program aimed at smaller DEC OEMs and other resellers.

In the UK, Gamma already purchases about 100 DEC systems per year and has about 120 software personnel, Colbert said. Because it buys hardware in large volumes, the UK firm receives a discount of about 35% from DEC.

Using the purchasing clout of its parent company, the New Hampshire-based OEM intends to offer DEC OEMs and other resellers discounts up to 28% on DEC hardware, Colbert claimed.

A typical DEC OEM sells about 10 to 15 systems per year, has two salespeople and employs about four programmers and

(Continued on Page 114)

DP Firms Advised to Sell to Third-Party Agents

By Donald A. Bernard
Special to CW

Talk to any ex-president of a high-technology company that has had financial problems and he'll tell you that building a better mousetrap is no guarantee of corporate success.

Problems with cash flow and with attracting sufficient investment capital to sustain the company while it builds equipment sales and recognition in the marketplace frequently prove insurmountable. A new company may collapse after a few years or, if it's lucky, be absorbed by a larger organization.

By selling to third-party equipment lessors and vendors, many emerging computer-related companies can avoid this cash crunch and achieve healthy, measured growth. Outright sales of equipment to lessors immediately improve cash flow for the fledgling company, thereby enhancing its financial position and ultimately drawing new investors.

During the past few years, leasing companies with expertise in marketing high-technology equipment and in financial planning have emerged. These lessors offer creative leasing programs geared to the specific requirements of the manufacturer and its customers.

According to a recent study, new lease receivables were expected to pass $25 billion in 1978, and the equipment leasing industry is growing at an annual rate of 10% to 15%.

In order to be competitive in the information processing equipment market, new companies must follow the pattern set by industry leaders and offer a leasing/rental program.

When the manufacturer holds the paper, however, the full recovery of manufacturing and related costs is staggered over the duration of the lease, which could be four or five years. If a short-term operating lease is involved, costs may not be recovered at all, since the term may be one year or less compared with the full recovery period of several years.

To support its program, a company must turn to banks and other lending institutions to finance the lease base. With the stock market what it is, funding for expansion and research and development must come from these outside sources as well.

The end result is a new company that is heavily in debt and that continues to fall deeper into debt to support the marketing and product development efforts necessary to keep it viable in the marketplace.

Sales to third-party lessors offer an important alternative to new companies that want to avoid a debt-heavy balance sheet. The lessor in effect becomes an alternative source of capital for the manufacturer.

The leasing agreement allows the lessor to assume ownership of equipment and all of the associated risks as soon as it is "purchased," providing the manufacturer with an immediate infusion of cash. As a result:

- The manufacturer gets an immediate return on his investment, and cash flows are improved.
- The equipment agreement with the lessor is treated as a sale for accounting purposes and goes on the books that way, thereby giving the manufacturer the ability to monitor and control the level of sales and resultant net income.
- The manufacturer's balance sheet and income statement figures are better. The company's valuation improves, putting it in a stronger position financially and increasing its borrowing power.
- The manufacturer can pursue and use outside funds for expansion, research and other company-building activities, rather than for "carrying" his customer.
- The manufacturer has the option of shifting the administrative burden of the leasing program to the lessor, who has an experienced in-place staff and knows the procedures for administering lease programs.

Important Marketing Tool

In addition to providing cash flow and accounting benefits, third-party leasing is an important marketing tool.

An important attribute of the manufacturer/lessor relationship is that the lessor need not preempt the relationship between the manufacturer and the customer. The leasing program can be created in the manufacturer's name, allowing it to retain its identity with the customer and build goodwill.

The manufacturer or its dealer continues to handle customer service and equipment maintenance just as if the equipment had been sold outright.

Many emerging companies may be aware of the benefits third-party leasing offers for growth and financial stability but may find it difficult to find organizations interested in their products or capable of developing successful lease programs for them.

This situation has been ameliorated in recent years by a "new breed" of leasing companies whose top people include financial, legal, marketing and technology specialists. After a thorough analysis of a company's products, markets and financial requirements, leasing programs are developed to meet the specific requirements of the manufacturer and equipment end user.

Bernard is the founder, president and chief executive officer of Intech Leasing Corp. of New York and of its parent company, Intech Capital Corp. He is a certified public accountant and a former chairman of the Finance and Leasing Committee of the New York State Association of Certified Public Accountants.

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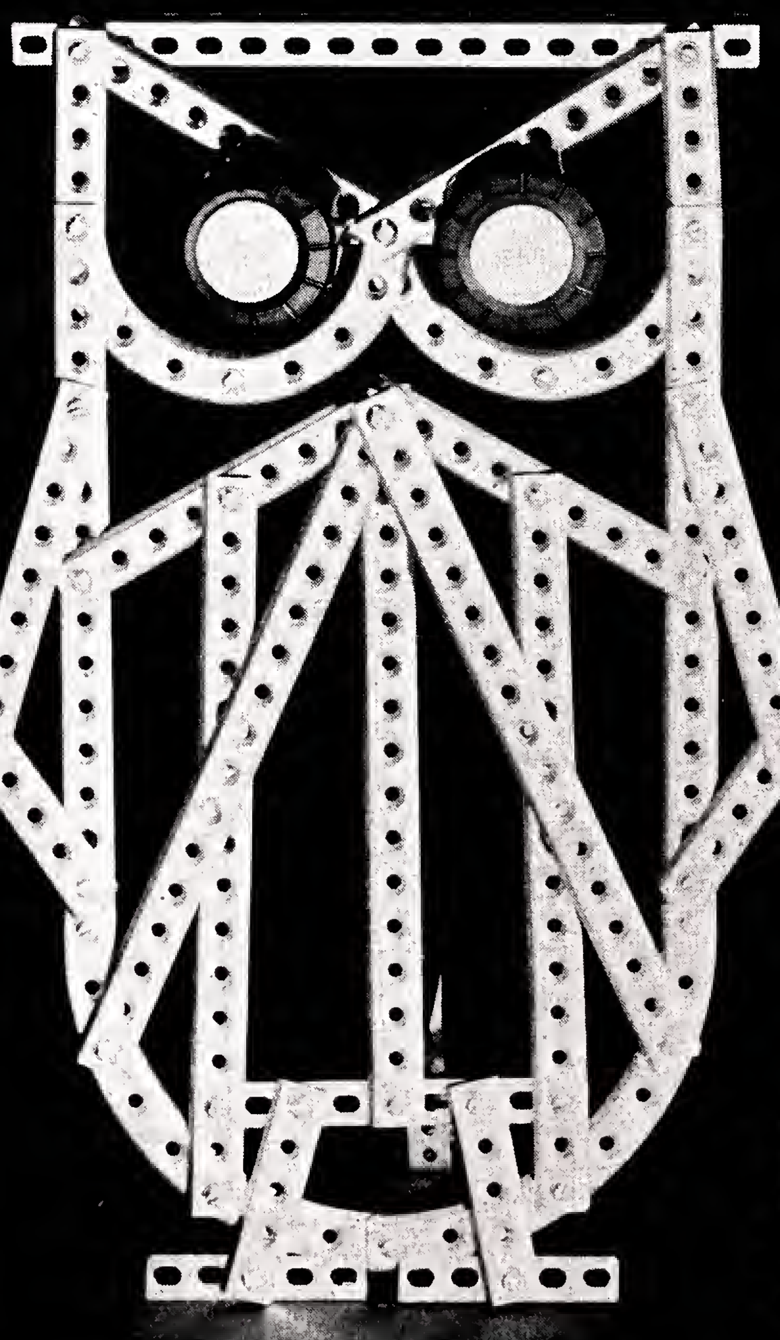

Independent of IBM TP monitors, the O-W-L system offers innovative Online Programming Without Limits.

O-W-L was designed by users to be the most productive programming tool in the IBM environment. The result is refreshing, and allows programmers to become system creators instead of code-writers.

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And O-W-L is cost-effective. Buy just the on-line programming features you need, the system will grow with your requirements.

We've put together the Online Programmers' Wish Book that tells you what you're missing by not using the O-W-L. It's free. Why not call or write us today for your own copy and, while you're at it, order the O-W-L system for a trial run. We'll ship both to you in the same box.

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Data Base Management.

The information in your computer is a valuable company asset, but only if it's accurate and up-to-date. And only if you can get it when you need it, in a useful form—not after waiting for a printout that tells you far more than you wanted to know. This seminar covers the advantages of using data base management, available in all HP systems, to organize and access your business information. *(1:30 PM, Day 1)*

Materials Planning and Control.

If you're a discrete manufacturing company, you probably are already looking at automating some aspect of your materials management. This seminar will present the advantages of using an on-line system to provide accurate and up-to-date materials planning and control. We discuss the engineering data control, standard product costing, inventory/order status and material requirements planning components of HP's MFG/3000 Materials Planning and Control System. Along with the experiences of some successful users, we will show how MFG/3000 lets you get started without first having to become a computer expert. *(8:30AM, Day 2)*

FOR EDP MANAGEMENT, STAFF & SOFTWARE OEMs:

Hewlett-Packard offers a selection of business computer systems, providing a wide range of solutions to end-user needs, as well as a variety of opportunities for the business OEM. Seminars are offered to describe and demonstrate each of these systems in detail.

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The HP 300 Office Computer System.

This seminar provides an opportunity for the OEM/computer specialist to see first-hand the remarkable capabilities that set the HP 300 apart from other small computers. Its innovative, multiple-"window" display system lets users compare and analyze information to support management decision-making and is an equally invaluable aid to program development. The HP 300 also includes a powerful virtual memory, yet is so compact and easy to use that it fits perfectly into departmental jobs like order processing and personnel management. *(8:30AM or 1:30PM, Day 1)*

The HP 3000 Family of General Purpose Systems.

HP's top-of-the-line 3000 Series, with over 2500 systems installed, is probably the most successful "super-mini" machine in the industry. The session will detail the experience of some of these users and will describe the principal members of this software-compatible family—the HP 3000 Series III and Series 33. Capabilities covered will include suitability for on-line transaction processing, data base management, and distributed processing and network applications. *(1:30PM, Day 2)*

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CFI, Decimus Make Out-of-Court Settlement

HACKENSACK, N.J. — Computer Financial, Inc. (CFI) and Decimus Corp. recently reached an out-of-court settlement for the payment of fees due CFI for the marketing and lease packaging services it provided to Decimus in 1975 and 1976.

Decimus, a subsidiary of Bankamerica Corp., allegedly owed CFI — formerly Computer Finders, Inc. — more than $1 million for assistance in building its portfolio of IBM 370 equipment.

Under the terms of the settlement, CFI will collect "more than 90 cents on the dollar on its basic contractual claims," Tom C. Martin, CFI's president, disclosed. The payment is contingent on both parties signing mutual releases abrogating CFI's right to share in certain residual values of the equipment and to assist Decimus with the remarketing of the equipment.

The settlement also calls for both parties to dismiss claims arising from a lawsuit brought by CFI in April 1978.

Heart of Suit

The heart of that suit was CFI's contention that Decimus deliberately started an investigation into vague allegations of bribery on CFI's part, using that investigation as an excuse to stop monthly contract fees owed to CFI [CW, Nov. 27].

In doing business with Decimus, CFI arranged a computer leasing program for the company whereby General Electric Credit Corp. (Gecc) agreed to purchase up to $200 million worth of new IBM computers that were to be subleased by Decimus to other companies.

In January 1976, Decimus and CFI entered into a written contract under which Decimus agreed to pay CFI origination and ongoing fees for each lease negotiated. In all, 17 computer subleases were executed under the Gecc program.

Investigation Started

Decimus continued to pay CFI until August 1977, when it began its investigation into possible bribery of its employees by CFI and other lease brokers seeking to do business with Decimus. CFI's suit claimed that its reputation had been damaged by Decimus' continued disparaging assertions that improper payments may have been made by CFI

Although CFI sought punitive and exemplary damages which would have been far greater than the actual fees owed by Decimus, it agreed to the settlement after weighing the cost of further legal action against the value of cash-in-hand today, the firm noted.

Depositions taken by CFI's attorneys in January revealed that Decimus launched its investigation based upon "mere gossip rather than substantiated fact," CFI said. Since CFI received the largest ongoing fee income from Decimus, Decimus' suspicions were based upon a "guilt by association theory," Robert S. Hardy, vice-president of CFI, explained.

CFI views the settlement as a tacit admission by Decimus that the witholding of fees was unjustified.

Three Form Firm to Make Custom Chips

SANTA CLARA, Calif. — Three former managers of National Semiconductor Corp.'s Computer Products Group have formed a company here that will develop and manufacture custom semiconductor memory boards and systems.

Called Zitel Corp., the privately held firm is headed by President Robert Welch, who was general manager of National's OEM Memory Systems Group.

Two other Memory Systems managers hold vice-president slots at Zitel. They are John Blackie, former director of engineering, and Bernard Wagner, one-time director of manufacturing at the National Semi group. Most recently, Wagner was director of operations at Ball Computer Co.

Zitel has booked its first year of production and will begin shipping products this month, according to Welch. The firm is establishing a network of systems representatives to market products nationally.

Zitel is located at 2900 Coronado Drive, Santa Clara, Calif. 95051.

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Nickels & Dimes

Printronix, Inc. will make its first public offering of common stock to fund product development, purchase production equipment, reduce bank debt and increase working capital. Of the 721,728 shares to be offered, 435,000 will be sold by the company and 286,728 by selling shareholders.

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Recognition Equipment, Inc. made a tender offer to persons holding fewer than 50 common shares. The purchase price per share was the lesser of $10 or the market price per share on the date of receipt, plus a $1 premium per share.

$ $ $

Scan-Data Corp. has amended its existing term loan and revolving credit arrangement with its commercial bank to increase its loan limit from $3 million to $4 million.

One an Ex-Intel Employee

Coke-for-Chips Scheme Nets Two

By Jeffry Beeler
CW West Coast Bureau

SANTA CRUZ, Calif. — An alleged cocaine-for-computer-chips swap ended unsuccessfully with the recent arrest of two men, one of them a former Intel Corp. employee.

Robert De Gallery and an unidentified second man face assorted criminal charges following their reported attempt to exchange an ounce of cocaine for $1,000 in cash and $37,000 worth of Intel memory chips.

Santa Cruz police have charged De Gallery, 27, with possession of narcotic paraphernalia and possession of cocaine with intent to sell. The Santa Clara County Sheriff's Department has charged him with distribution of dangerous drugs and two counts of attempted grand theft.

The second man, whom Intel's security officer John O'Locklin declined to identify for the record, has been charged with conspiracy and one count of possession of stolen property.

De Gallery reportedly arranged the drugs-for-chips trade through a plant supervisor he contacted at Intel's components assembly facility here. The supervisor feigned interest in De Gallery's alleged plan and then passed word of the deal to his superiors.

Intel, in turn, notified the local police, who urged the supervisor to proceed with the exchange. While law enforcement officers watched in hiding, the supervisor allegedly twice supplied De Gallery with Intel Model 2114 static random-access memories, according to Sgt. William Aluffi of the Santa Cruz Police Department.

After the second transaction — both took place here — police followed De Gallery to nearby San Jose, where he was arrested.

Not the First Time?

Police had hoped to delay the arrest until they learned where the stolen chips were ultimately headed. They abandoned that plan, however, when De Gallery showed signs of suspecting a trap.

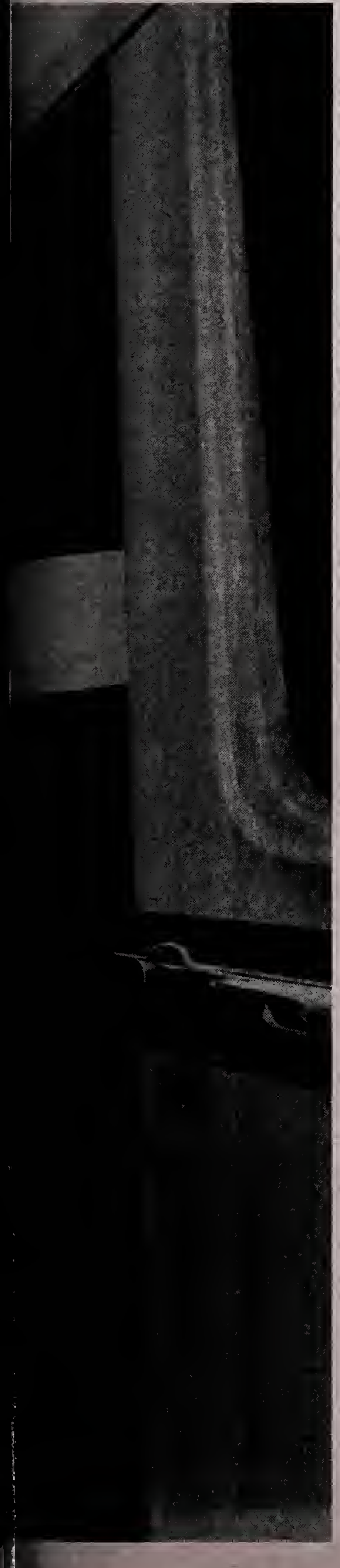
Neither O'Locklin nor Aluffi claimed to know who, if anyone, was to have received the illicit chips. They also refused to speculate about whether the cocaine-for-chips deal represented De Gallery's first or only his most recent attempt to steal Intel products, but Aluffi said police are studying the question.

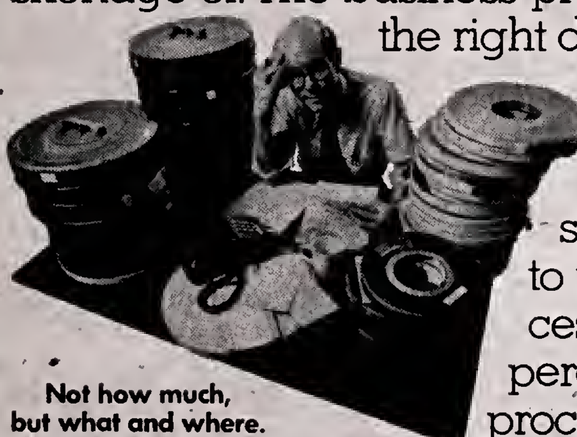
O'Locklin, however, raised the possibility that thieves have already pilfered Intel chips other than the 2114, but he declined to name the types of components involved.

In the past, Intel has uncovered instances in which customers have bought the firm's chips from independent suppliers for three times the going rate. Most of the illegal trade in semiconductor memories stems from the widening gap between the products' supply and demand, O'Locklin said.

Before De Gallery's arrest, the suspect operated a one-man probe card testing business named Unlimited Semiconductor Services, Inc. Housed in an 8-foot by 10-foot office, the local firm was among several companies and residences searched by police following De Gallery's arrest.

In addition to owning his own business, the suspect had worked previously as a supervisor at the Intel plant where he arranged the alleged drugs-for-chips deal, O'Locklin said.





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Starting a Company: Challenging But Frustrating

By Marcia Blumenthal
CW Staff

MANCHESTER, N.H. — Patricia A. Colbert had a promising marketing career at Digital Equipment Corp., but she recently opted to leave DEC and head up a new business.

With $100,000 in funding provided by the UK's Gamma Computer Group, one of DEC's largest commercial OEMs, Colbert took on full operating responsibility for Gamma's new subsidiary, Gamma Computer Corp. here. Started in April, the firm is a commercial DEC OEM that will also begin wholesaling DEC hardware and Gamma Group software packages nationally within the next six months.

While starting up a business has been challenging for Colbert, she has also had to live with a high level of frustration. At DEC, where employees have nearly unlimited resources, they can concentrate on getting a specific job done, she observed. Starting a business is frustrating because tasks are not accomplished quickly.

Moreover, Colbert said she knew she would be isolated, working on her own for a long time. At DEC she often worked on committees or teams.

Fortunately, she had the support of Dr. George Coggan, managing director of the UK group, who advised her about the frustrations she would experience in establishing a company.

Establishing recognition and a credit line for the firm are some of the major problems Colbert is now facing.

Although she had 13 years of marketing experience, first with a pollution control company and then with DEC, Colbert is learning to run a business the hard way. "But, fortunately, I have a good support system of friends who are in various industries such as banking." These friends are giving Colbert a good deal of advice.

Assistance is also coming from other quarters. A retired executive who read an article about Colbert in the local paper volunteered to teach her about importing and exporting.

Colbert started in the computer business two and a half years ago, when she was hired by DEC as a communications liaison between the company and its commercial OEMs. DEC had just started its commercial OEM effort.

While at DEC, Colbert chaired a small systems strategy committee and wrote the marketing proposal for the retail store venture. She masterminded the Corita Kent decorative art panels used on some DEC systems, as well as the gift selection program used at DEC's New Hampshire retail store last Christmas.

CW Photo by M. Blumenthal

Patricia A. Colbert

Just prior to leaving DEC in February, Colbert was a principal marketing specialist for the newly formed Retail Products Group.

Working at DEC was a tremendously creative experience for Colbert. "Employees are autonomous and pretty much do their own thing if they can prove their projects will help the firm reach its goals. You have to bargain for everything you get," she said.

But there were drawbacks. In some ways, the company is a "boys club. If I were a man, they would have recognized me a lot more quickly than they did," she believes.

UK Firm Forms Subsidiary To Sell to DEC OEMs Here

(Continued from Page 109)

system personnel, according to industry sources. These OEMs are currently eligible for only an 18% to 25% discount from DEC.

Besides offering resellers an opportunity to improve margins on hardware, Colbert sees the ability to provide value-added services the major contribution Gamma will make to its customers.

Gamma will be marketing all of the parent company's software packages as well as offering management expertise as a DEC commercial minicomputer specialist.

"These systems will be aimed at four major market segments: manufacturing, distribution, retail and financial," Colbert noted. While at DEC, Colbert was responsible for establishing channels of communication between the company and its commercial OEMs. DEC is not yet as responsive to OEMs as it could be, Colbert maintained.

For example, salespeople are not always sympathetic to dollar-conscious OEMs, she said, pointing out that DEC's overhead is expansive, which causes friction between the customer and the OEM.

DEC hasn't recognized the true worth of the value-added services OEMs provide, according to Colbert. "Some hardware manufacturers think OEM customers will continue to buy from them through any adverse conditions. Gamma thinks this attitude is naive.

"OEMs will seek other vendors that provide timely service and delivery. Hardware manufacturers must recognize the need for more levels in the channel," Colbert declared.

The Gamma Computer Group provided about $100,000 in funding for the new company. Colbert expects revenues of $1 million in the first year of operation and $10 million within three years.

CA Facing Lawsuit, SEC Probe Over Finances

IRVINE, Calif. — Computer Automation, Inc., in the midst of financial woes, faces possible litigation and a Securities and Exchange Commission (SEC) investigation, both relating to charges that the firm falsified certain information on its financial status.

A CA stockholder filed a class action suit against the company and certain of its officers and directors, alleging that between Aug. 30 and Oct. 20 last year the defendants made false statements pertaining to CA's financial condition.

The CA officers named in the action were David H. Methvin, president; Robert E. Rawlins, chairman; and Peter M. Kopkowski, vice-president of finance.

The suit was filed in the U.S. District Court of the Eastern District of Pennsylvania by Alvin J. Ivers, who purchased 100 shares of CA stock in September 1978. According to the court clerk's office, CA has not yet responded to the charges.

In addition, the SEC has issued a formal order of investigation to allow SEC staff members to look into allegations that CA officers and directors made misleading statements while engaging in company stock transactions.

A CA spokesman said the investigation concerns trades made prior to April 1979, but would make no further comment on either matter. Ivers' attorney could not be reached by press time.

Losses, Defaulting Expected

Earlier, the firm said it expects to report a loss for the fiscal year ended July 1 as a result of "continuing problems with receivables and imbalanced inventories."

At year-end, the minicomputer manufacturer will also be in technical default on certain covenants of the bank loan agreements now being renegotiated with Citibank and Security Pacific Bank; according to Paul Hoff, newly named vice-president of finance, treasurer and chief financial officer.

CA's bank debt currently stands at $17.7 million, Hoff said. The bank agreements, however, called for the firm to reduce its $20 million loan to $15 million by June 30.

Noting that year-end audit results will not be available until August, Hoff did comment that sales for the nine months ended March 31 were $52 million, up from $43.6 million for the similar period in 1978. Earnings, however, dropped to $367,000, or 18 cents a share, from $4.6 million, or $2.32 a share last year.

Hoff, former vice-president of finance, treasurer and secretary at MSI Data Corp., was hired by CA barely a month ago to replace chief financial officer Kopkowski. Kopkowski resigned but will remain with the company as a consultant, according to CA.

Attributing the firm's financial troubles to "receivables and inventory problems," Hoff stated, "We have substantional reserves on the books for inventories, but we won't know if they will be sufficient until the year-end audit is completed."

He added the firm is investigating "to what extent inventories are obsolete or excessive" and would have to be written off.

Stock Priced, Earnings Decline

Reflective of CA's financial doldrums was an almost steady decline in the firm's stock price, which fell from $20.50 on April 30 to $11.50 last week.

Despite increasing revenues, earnings began to slip in the final quarter of 1978 when the firm reported $1.5 million, or 77 cents a share, down from $1.8 million, or 93 cents a share for the fourth quarter of 1977.

At the time, CA attributed the earnings decline to manufacturing delays — in part caused by defective memory components received from a major supplier — and to heavy start-up expenses for its German subsidiary [CW, Sept. 18]. Hoff said the company's two foreign subsidiaries in Germany and Britain had reported losses, but noted they "may not end up with tax losses at the end of this year."

He admitted that, earlier this year, the firm experienced parts shortages which, coupled with faulty memory parts, delayed deliveries of Syfa business computer systems from CA's Naked Mini division.

Hoff added, however, he has "seen no evidence" that this situation still existed.

Executive Corner

- Martin Weisbart has been appointed director of the International Systems Department at ITT World Communications, Inc.
- Donald R. Dooley has been named vice-president of sales for Southern Systems, Inc.
- W. Edward Williamson has been named vice-president of industrial business operations for Honeywell, Inc.'s Process Management Systems Division.
- The Genasys Corp. has announced the following promotions: William E. Griffis to senior vice-president of corporate development, John W. Larmer II to corporate vice-president, James N. Nook to corporate vice-president, Ronald S. Husey to vice-president, Myron B. Jonsberg Jr. to vice-president, C. Daniel Looper to vice-president and David A. Mucka to vice-president.

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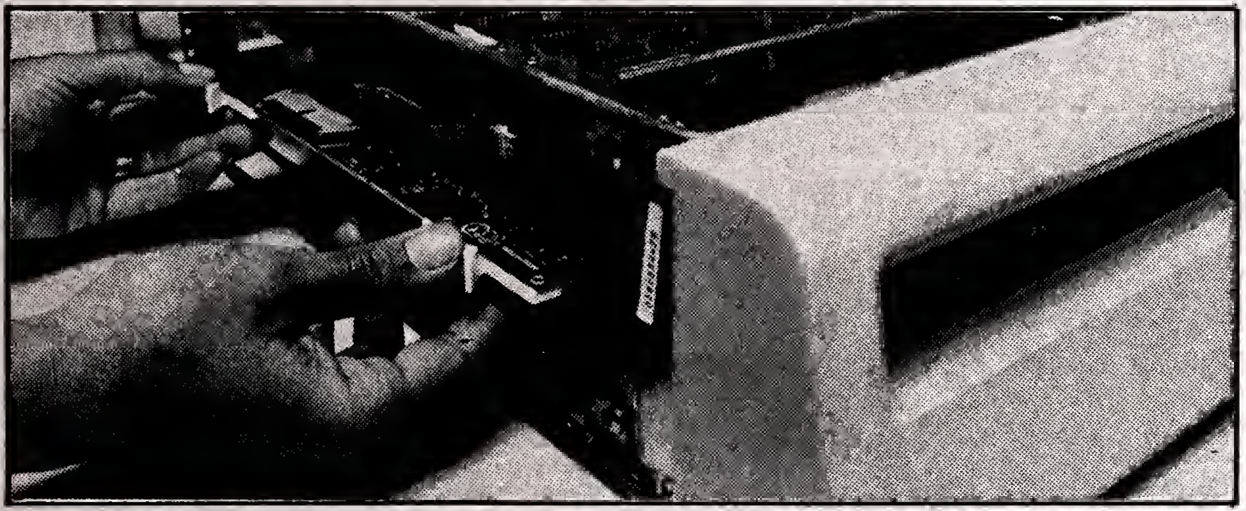

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Datum Enters OEM Mart for Tape Transports

ANAHEIM, Calif. — A magnetic tape transport with self-diagnostic capabilities and single printed circuit board design marks Datum, Inc.'s entry into this OEM market.

Through microprocessor control, the D-451 tape transport is said to offer a reduced electronic componenet count, hybrid chip read amplifiers and self-diagnostics, eliminating the need for an external test box. Self-test features include fault isolation and skew verify alignment.

The D-451 was designed with a 45 in./sec tension arm and single printed circuit board architecture, enabling users to configure systems that include 7- or 9-track NRZI and phase-encoded (PE) tape formats, the minicomputer peripherals manufacturer said.

OEM Products

Datum offers PE tape densities of 1,600 bit/in., while densities of 800-, 556- and 200 bit/in. are available for NRZI.

Provided with the tape transport are IBM tape-path geometry, ceramic blade tape cleaners, photoelectric write ring detection, low inertia capstan drive, digital write deskew control and an embedded dual-density formatter that controls up to four tape transports, the firm said.

Priced from $3,900 per unit, the D-451 is targeted primarily for volume users such as OEM systems integraters. Datum said it will begin production deliveries in October.

Plans are to convert existing facilities to fully automated tape manufacturing operations to allow the firm to deliver several hundred tape drives per month. Datum is located at 1363 S. State College Blvd., Anaheim, Calif. 92806.

Floppy Compatible With Multibus

WALTHAM, Mass. — A Multibus-compatible dual-drive floppy disk subsystem was introduced by Comark Corp.

Called the MF 80, it is available as either a single-density (IBM-compatible) or a double-density (Intel-compatible) system, according to the firm.

Each drive is said to feature a unit select switch to select either drive as Logical Unit "O" and a "write protect" switch to prevent accidental erasure or overwriting of diskettes.

The MF 80 also includes the interface, a 5-ft cable and dual Shugart floppy disk drives in a 5.25-in. chassis, with 19-in. rack mounting hardware available as an option.

The system is priced at $3,495; delivery is 30 to 60 days from Comark, 257 Crescent St., Waltham, Mass. 02154.

Japan Agrees to Slash DP Tariffs

(Continued from Page 109)

which have tariffs running as high as 100% — rely on tariffs for real income. The ability of a nation to enrich its treasury by millions of dollars for every large-scale computer system imported into the country is a strong incentive to maintain high tariffs, Smoot noted.

Smoot, a member of the Commerce Department's Industry Sector Advisory Committee on Office and Computing Equipment, predicted a "significant change" in U.S. export levels to Japan, although he said he is unaware of any quantitative projections on increased U.S.-Japan trade resulting from the tariff agreements.

The psychological effect alone will help increase U.S. exports to that country, he said. The Japanese move, "even in anticipation, will make more [U.S.] companies willing to invest in trying to export to the Japanese."

With the increasing popularity of smaller computers, he added, the lower tariffs will be all the more effective in spurring U.S. exports. As the unit price goes down on computer equipment, the tariff factor becomes more and more important, he pointed out.

Surprised at Canada

Addressing the Canadian decision, Smoot said he was surprised that country did not eliminate its tariff on DP hardware altogether. In fact, he observed, Canada had talked of doing just that.

Because Canada imports almost 100% of its hardware and is trying to develop its software industry, it would make sense for it to do away with import surcharges for computer equipment, he said.

Now that the tariff cuts have been agreed upon, there remains "a highly technical argument" about how to phase in the new levels, Smoot continued. The cuts will gradually be made over the eight-year period, which begins in January 1980, but there has been no agreement on whether to lower them a percentage point or half a percentage point at a time or through some other mechanism.

"This is a political — not a mathematical — problem," Smoot said.

He also noted that tariffs are only part of the trade barrier problem. Changes in standards and government procurement regulations in the various countries are also being negotiated.

But tariff reductions are a good first step, according to Smoot, who predicted other types of trade barriers will arise as the more obvious ones are negotiated away.

"No country that has the ability to do otherwise is going to let its economy be impacted in a negative way by trade if it can avoid it," he said.

Contracts

Hetra has received a $2 million contract to provide computer systems and line printers to the U.S. Army.

General Telephone and Electronics Corp. has received a $4.8 million U.S. Army contract to provide field support for a tactical communications acquisition and analysis system.

Compuscan, Inc. has been awarded a $2 million contract for lease and maintenance of 20 Comet II systems from the Defense Commercial Communications office at Scott Air Force Base.

BDS Computer Corp. has been awarded a General Services Administration contract to supply Dataproducts Corp. printers to government users.

Iowa-Des Moines National Bank has signed a $6 million contract with Diebold, Inc. for 23 Tabs 9000 automatic teller machines.

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DG Revenues Rise 35%, Earnings 34% in Quarter

WESTBORO, Mass. — Data General Corp. reported a 35% increase in revenues and a 34% increase in earnings for its third quarter compared with last year's results.

Revenues for the latest quarter totaled $119.1 million compared with $88.4 million in the comparable 1978 quarter. Earnings topped $12.5 million, or $1.21 per share, up from $9.3 million or 93 cents per share in the year-ago period.

Total revenues for the year to date reached $336.5 million vs. $245.3 million for the first three quarters of 1978. Earnings for the nine-month period totaled $36.4 million or $3.55 per share compared with $25.9 million or $2.60 per share for the same period a year ago.

The company invested 10.1% of its revenues in research and development in 1978, which was more than any other major computer company, according to a study published by *Business Week* recently. DG ranked fourth in R&D expenditures among all 683 companies listed in the survey.

During its past fiscal year, the firm said it announced more than 27 products.

SDA Jockeying for Place In IBM Software Market

(Continued from Page 109)

of the potential of Dimension V, a data center scheduling system.

"Dimension is a sophisticated on-line scheduling system that really cleans up the data center operation, where much scheduling has been done manually," Goldberg said. Dimension allows managers to schedule jobs throughout the year via a data base built by SDA, as well as call jobs on demand.

It allows operators to know where the job is and allocates the hardware required, thereby reducing reruns and giving the operator a tremendous amount of control, Goldberg said.

Dimension V, which is the outgrowth of earlier Deadline, Streamline and Bottomline software products, runs on large-scale 370-type machines under OS. It also allows the data center to do sophisticated modeling, so DP managers can determine what their future systems plans would actually allow them to produce.

Dimension V sells for about $60,000, which includes installation and training.

The 10-person Software Systems Corp. was struggling to sell the relatively new product. "They needed resources to exploit the system," Goldberg said. "It was a good acquisition for both of us. The customer lists of SDA, Intercomm and Software Systems Corp. overlap considerably."

Most Important Product

While SDA sales representatives have always actively sold professional software services, they will now also be selling SDA's training expertise, Intercomm and Dimension.

But SDA's most important product remains its people, Goldberg said. He likens the software house to other service industries such as advertising or accounting firms. In the same way advertising firms have account executives, SDA has people managers, 10 full-time managers whose hours are nonbillable and who visit SDA employees at client sites every week.

To build its staff, SDA provides generous incentives including $1,000 for each in-house referral of people actually hired. "Where better for software professionals to practice than a software firm?" Goldberg asked. "If I were an accountant, I would want to work for a CPA firm.

Supershorts

Univac plans to consolidate a number of its marketing support offices — in leased facilities in the Washington, D.C. area — into one 250,000 sq-ft building to be constructed near McLean, Va. Slated for occupancy in the spring of 1981, the facility will house, among other operations, Univac's Federal Systems Division, which supplies commercial computer systems to the U.S. government.

— — —

A. B. Dick Co., office equipment manufacturer, will enter the small business computer market through a marketing agreement with Randal Data Systems, Inc. This fall, A. B. Dick will introduce a $12,000 desktop computer manufactured by Randal and designed for businesses with annual sales between $200,000 and $2 million.

— — —

Sorbus, Inc. has started a program to provide regional repair service for digital printed circuit boards, designed to speed repairs by eliminating the need to send all faulty boards to its Boston factory. Currently, the repair program is operating in the Chicago area, and Sorbus plans to expand the service to 11 of the firm's other repair districts by the end of the year.

— — —

Honeywell, Inc.'s Spectronics Division, supplier of infrared optoelectronics and fiber optics, added Jaco Electronics, Inc to its West Coast distributor network, which also includes a number of Arrow Electronics, Inc. franchises.

— — —

Astrocom Corp. signed North Supply Co. — a United Telecommunications, Inc. subsidiary — to distribute its line of data communications equipment that includes low- and medium-speed modems, modem test sets and acoustic couplers.

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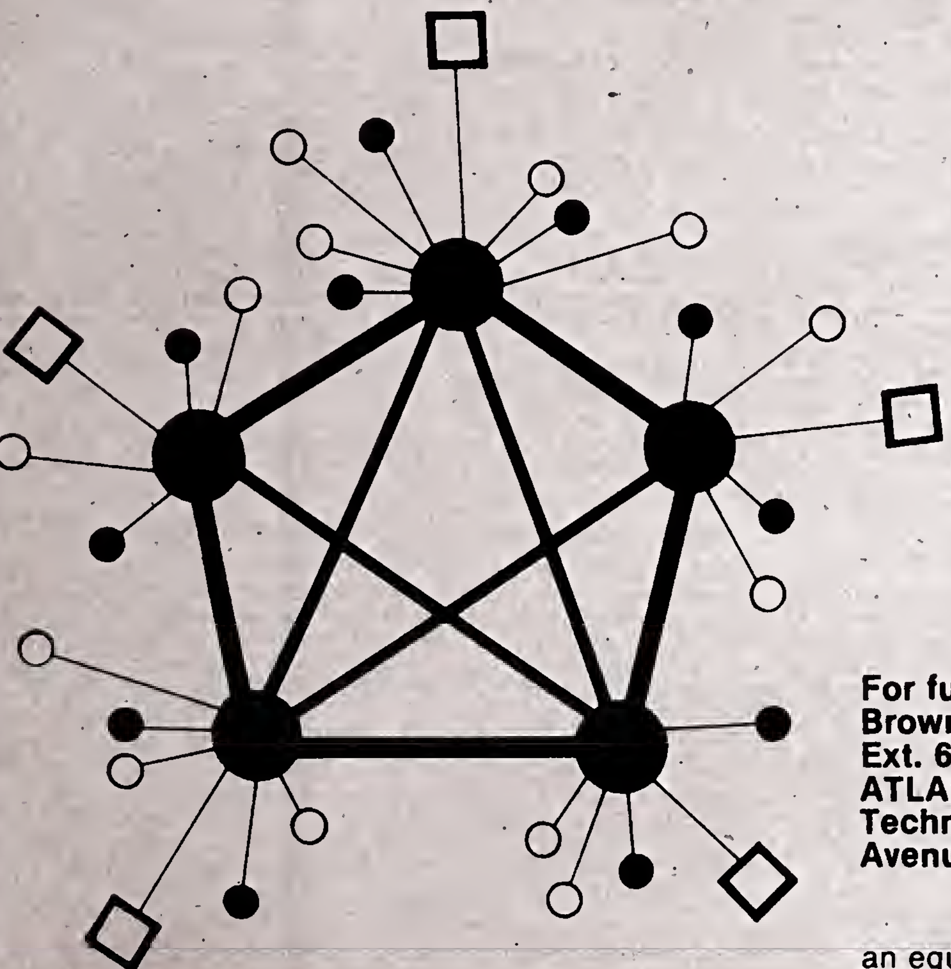

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KANSAS CITY
Cont'd.

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PROGRAMMERS
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EOE M/F

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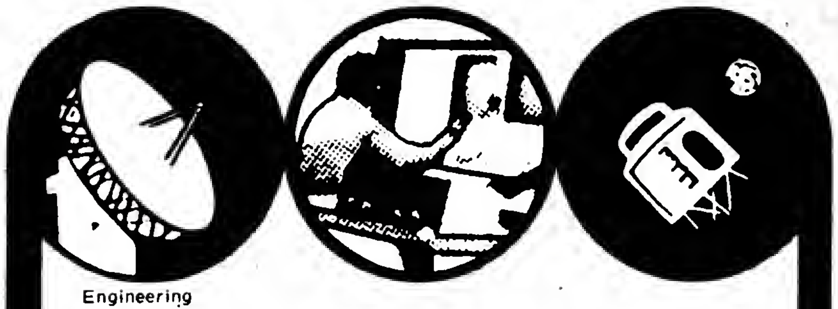

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The teams now being formed to develop these products will also provide necessary consultant services to our publishing clients.

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Project Analyst II in Department of Preventive Medicine and Environmental Health, College of Medicine, University of Iowa, beginning August 1, 1979. Requires Master's degree in Comptuer Science or Statistics; programming experience of at least three years is necessary; knowledge of system procedures and techniques; knowledge of Cancer Epidemiology, Demography and Statistical Analysis, i.e. design of epidemiological studies, regression analysis, multivariate analysis, categorical data analysis nonparametrics and standardization techniques is necessary. Working experience with PL/1, FORTRAN and ASSEMBLER; experience with the statistical packages GENCAT, BMD and SAS is necessary. Experience with IBM utilities is necessary. Working experience with the installation's operating system is highly desirable. Salary range $15,570 to 20,100 depending on qualifications. Send resumes with three references to:

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  Assist our customers and field personnel in the use of our performance product line. Some familiarity with OS and/or DOS internals highly desirable. Light travel.

Call ADR collect at 609/921-8550 or send your resume with complete salary history to:

DIRECTOR, CORPORATE PERSONNEL

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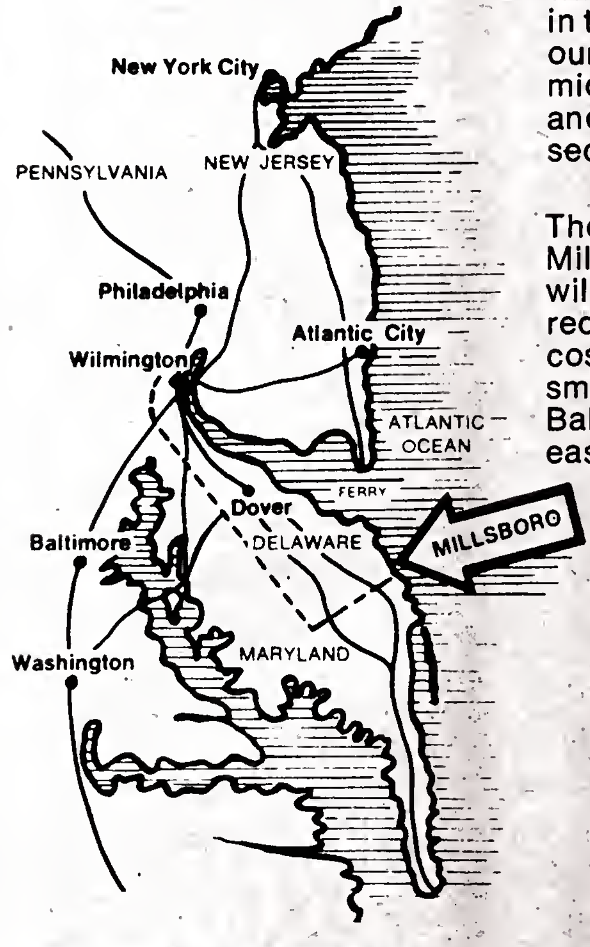

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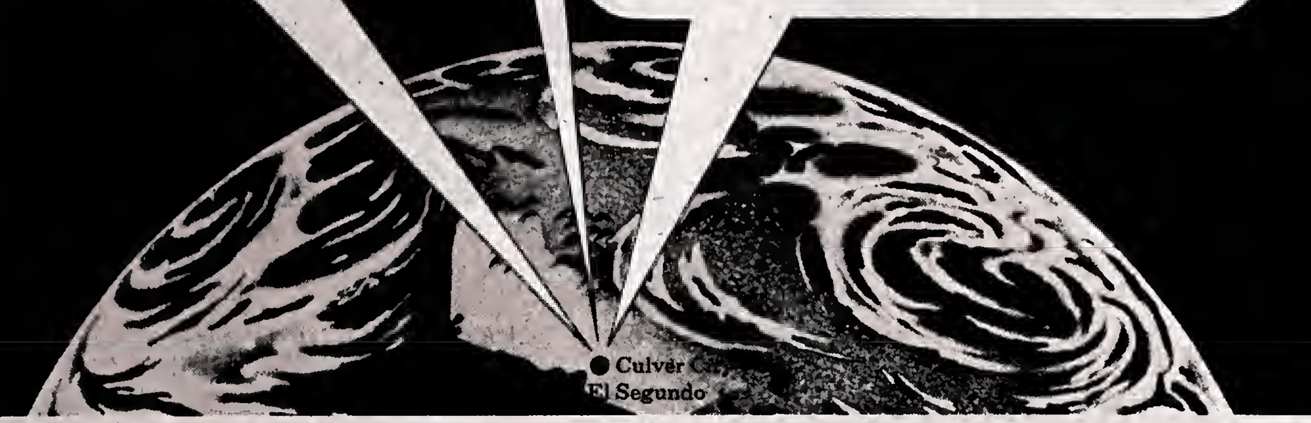

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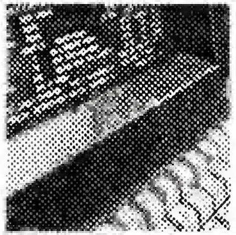

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You will coordinate the activities of project leaders and functional support groups to provide cohesive overall management of the "system development" process for small computer-based systems employed in science, engineering, and business activities. Other responsibilities include managing the development and implementation of sensor-based data acquisition systems, real-time software, scientific application packages, signal processing, distributed lab systems, and scientific data management systems.

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919/584-5591

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Widespread application of process computer systems to Aramco projects in all areas has stepped up the need for experienced computer specialists.

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1. Evaluate new requirements and priorities for information and data.
2. Recommend the deletion or modification of existing applications.
3. Recommend methods of project achievement, i.e. use of contract services or in-house staff.
4. Act as Project Administrator.
5. Design and implement information systems.
6. Evaluate computer hardware.
7. Supervise Systems Analysts, Computer Programmers and other assigned personnel.
8. Report on project status.

This is a partial list of the wide ranging tasks necessary to create a comprehensive information systems network to meet current and future needs of the Municipality.

The successful candidate will have a business or government related degree with at least eight years growth experience in developing and managing information systems for a large diversified organization. Specific background in large software and hardware applications including budgetary responsibility is necessary. This position requires that the incumbent be responsible only to the Municipality of Anchorage for all phases of performance, compensation and benefits.

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Our Roseville location, N.E. of Detroit, has several positions available in our rapidly expanding D.P. Department.

The candidates we seek should have a Computer Science or Math background coupled with 2–8 years experience on IBM 360/370's. A solid background with the IBM OS/VS operating system, COBOL business applications, and CICS requisits. Telecommunications exposure is a plus factor.

If you are seeking a career in a solid Fortune 500 Company with an opportunity to help build a unique applications data base, send your resume and salary requirements in strictest confidence to **CCEC/McCullagh Leasing, Inc., 30803 Little Mack Avenue, Roseville, MI 48066, ATTN: Bessie Essex, Personnel Administrator.** Liberal salaries and fringe benefits, plus relocation are authorized.

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Senior Programmer Analyst

We are the recognized leader in the design and manufacture of Data Tablets/Digitizers. Since our inception in 1973, sales have increased dramatically. We have recently expanded into the field of computer aided drafting systems. As a result, we have an immediate need for a Senior Programmer/Analyst.

The candidate selected will have a strong scientific/technical background on small minis and micros, using FORTRAN and ASSEMBLER. NOVA or MICRONOVA experience a plus. Experience with RS232 software drivers, plotters and computer graphics is desired.

We offer competitive salary and a comprehensive benefits package. Equally important, however, is the chance to join a dynamic, successful organization whose growth rate points to a sound, prosperous future with unlimited career opportunities. Please send your resume including salary history to Walter R. Simcik, Manager of Human Resouirces, Summagraphics Corporation, 35 Brentwood Ave., Fairfield, CT 06430; or call (203) 384-1344. We are an equal opportunity employer.

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Interactive Data Corporation, a wholly owned subsidiary of the **CHASE MANHATTAN BANK**, offers computerized corporate planning, econometric modeling and financial analysis capabilities to major corporations and to the international banking and investment community.

In order to enhance our premier position in our marketplace, we are developing a relational data base management system to complement our existing proprietary data base management system.

We are seeking contributors for the following positions:

• Programming Development Manager

The candidate selected for this innovative position will have proven ability to manage the design and implementation of programming systems. A strong background in BAL programming and an in-depth knowledge of one or more data base management systems are essential.

• Product Manager

This position offers a high degree of visibility, both within the Corporation and with our clients. The individual chosen will assume responsibility for staffing, as well as development and implementation of the marketing and support program for our proprietary data base systems. A background in marketing and support of software products, coupled with solid experience in one or more data base management systems, is required.

• Product Management

Several positions are available for Assistant Product Managers for our data base management products. Qualified individuals will have one or more of the following skills:

- Knowledge of one or more data base management systems
- Applications programming experience
- Development of use documentation
- Marketing or support of data processing products.

All positions are located within easy driving distance of the educational, cultural and recreational facilities of Boston and New England.

Please respond in confidence to: **Randi Arendt, Interactive Data Corporation, 486 Totten Pond Road, Waltham, MA 02154 or call: (617) 890-5387, or (617) 890-6416 (evenings, collect).**

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SYSTEMS PROGRAMMER

Mid-Illinois Computer Cooperative seeks applications for a position of systems programmer. Applicants should have a bachelors degree with coursework in computer science or related field, one or more years of practical experience with Control Data 6000 or Cyber systems, an understanding of KRONOS and/or NOS operating systems and COMPASS, and an ability to present technical material clearly and effectively. MICC uses a Cyber 170-730 NOS system to supply interactive and batch computing services for academic use in higher education.

Salary range is $16,000 — $21,000 depending upon qualifications, plus excellent fringe benefits. Resumes should be sent to W. Parrill, Executive Director, Mid-Illinois Computer Cooperative, Cottonwood Office Center, Cottonwood Road, Edwardsville, IL 62025.

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Systems Analyst

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You'll assume responsibility for design through implementation of small to medium scale automation projects. You should have 2+ years in systems development, working knowledge of OS, JCL, COBOL and IMS and good oral and written communication skills.

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You will work with application development teams performing database design and administrative functions. You should have 6+ years in data processing, with 3+ years as a database analyst, experience working with OS/MVS-SNA-IMS DB/DC software equipment. You should be aware of IMS/VS facilities productivity aids, programming languages, knowledge of performance, recoverability and security factors in database design.

If you recognize this opportunity for advancement in your career, we'll be pleased to receive your resume addressed to K. Campbell , Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco, CA 94120. An equal opportunity employer m/f/h.

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Pacific Northwest

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- Effectively interface with communications users, systems managers and vendor service contacts.

The successful candidate will have 3–4 years experience managing a telecommunications technical control facility.

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ATLANTA AREA

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Send confidential resume to: Mr. George Rice, Manager, Professional Placement, Engineering and Manufacturing, Dept. N50 , NCR Corporation, 16550 W. Bernardo Drive, San Diego, CA 92127.

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  — Generate, maintain, control production and test data bases.
  Define and implement interactive Query Language Elements and Syntax
  — Control Data Dictionary
- MIS Applications

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- Design machine emulators and virtual machine interpreters
- System design of multiprocessor distributor logic systems
- Design/implement Distributed Processing Systems using VLSI technology
- Systems Performance Measurement

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- Interface with H/W, F/W, S/W Designers

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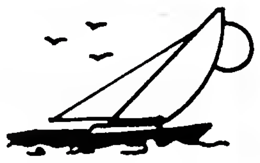

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The position.

We're looking for systems analysts at all levels who are interested in working in a prime vacation area.

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Participate in the technical design of computer systems. Design, code, debug and document applications software programs following accepted standards. Degree desirable but not required. Minimum of 3 years' experience with COBOL, CICS, DOS, RPG, DL/1 and IBM 370 or higher.

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Formulate logical descriptions of business problems and provide logical solutions to these problems. Must be able to analyze existing systems, both manual or computerized, and formulate logical methods using state-of-the-art techniques in the design for solutions to these problems. 3–4 years' experience in systems evaluation and design in a manufacturing environment required. Background must include data base and on-line systems.

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Please send your resume, including salary history to Denise Bridgeman, QUME CORPORATION, 2350 Qume Drive, San Jose, CA 95150. (We're just off Highway 17 at Montague Expressway). (408) 924-4000, Ext. 4309. We are an equal opportunity employer M/F.

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University of Michigan-Flint

Applications are invited for the position of Director of Computer Facilities at The University of Michigan-Flint. Applicants should have an M.S.degree in Computer Science or closely related field, experience in university computing centers (both academic and administrative) and management experience. The position includes budgetary responsibility and long range planning and development for the areas of academic and administrative computing. Present hardware includes: Harris 1200 RJE communicating with an Amdahl 470/V7, Four Phase RJE communicating with an IBM 370/158, and many timesharing terminals throughout the campus. The Computer Science Department owns a Burroughs B1800 which is maintained by the academic computing center. The University is selecting a midsize computer for administrative use.

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University of Michigan-Flint
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If you have not had prior experience in technical writing but have functioned as a Field Engineer, Systems Analyst, or Senior Electronic Technician and have a desire to be a Technical Writer, please send resume and salary history to: Mr. Ken Uhlig, Engineering and Manufacturing, NCR Corporation, Dept. L50, 3325 Platt Springs Road, West Columbia, S.C. 29169

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PROGRAMMER ANALYST, ACADEMIC APPLICATIONS

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Send resume to: Mr. Mike Mantell
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Director of Data Processing

This is a senior administrative position with responsibility for administrative computing services for Southern Illinois University at Edwardsville. The computer system includes an IBM 370/145 operating under OS/VSI with a teleprocessing monitor and data base manager. Qualifications include demonstrated managerial capability, planning and budgeting expertise, a knowledge of hardware, software and applications. Experience in a university environment is preferred, but is not required. Salary: open, liberal fringe benefits. Application deadline: August 1, 1979.

As an affirmative action employer, SIUE offers equal employment opportunity without regard to race, color, creed or religion, age, sex, national origin, or handicap.

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SYSTEMS PROGRAMMER/ANALYST

$32,495 — $37,305

Bachelor's degree with emphasis in computer science, programming and data processing appplications or equivalent professional training. Minimum three years successful experience as systems programmer, programmer/analyst, or systems analyst required, three years experience in educational applications of data processing. Demonstrated knowledge of two or more programming languages; FORTRAN IV; BASIC: PL/1; COBOL: ASSEMBLY: or APL. Knowledge of computer operating systems, time-sharing computer systems and teleprocessing systems required.Ability to perform systems programming, system generation, systems analysis and develop operating procedures and carry out systems evaluation is required. Knowledge of mini-computer systems and their applications is desirable.Knowledge of optical mark reading systems is desirable. Knowledge of and ability to program PDP11-34 Computer, RSTS/E operating system and National Computer System Sentry-70 Optical Mark Reader desirable. **Applications are available in the Personnel Department at the above address. Applications and resumes must be submitted to the Personnel Department no later than 5:00 p.m. on August 3, 1979.** 1979/80 salary currently being negotiated.

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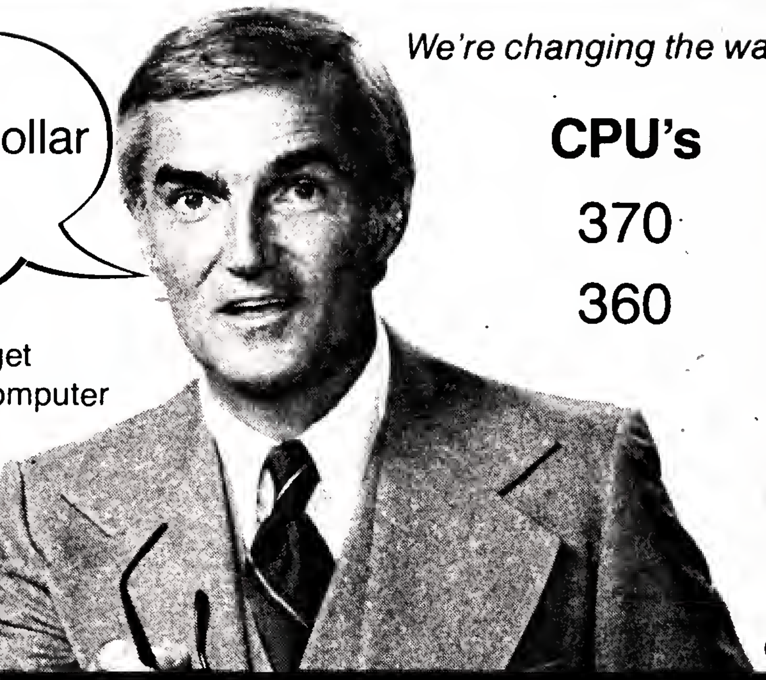

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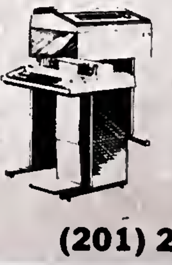

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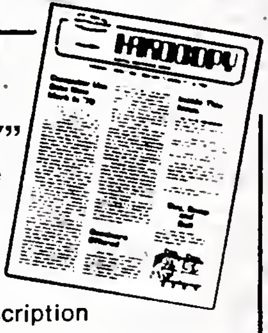

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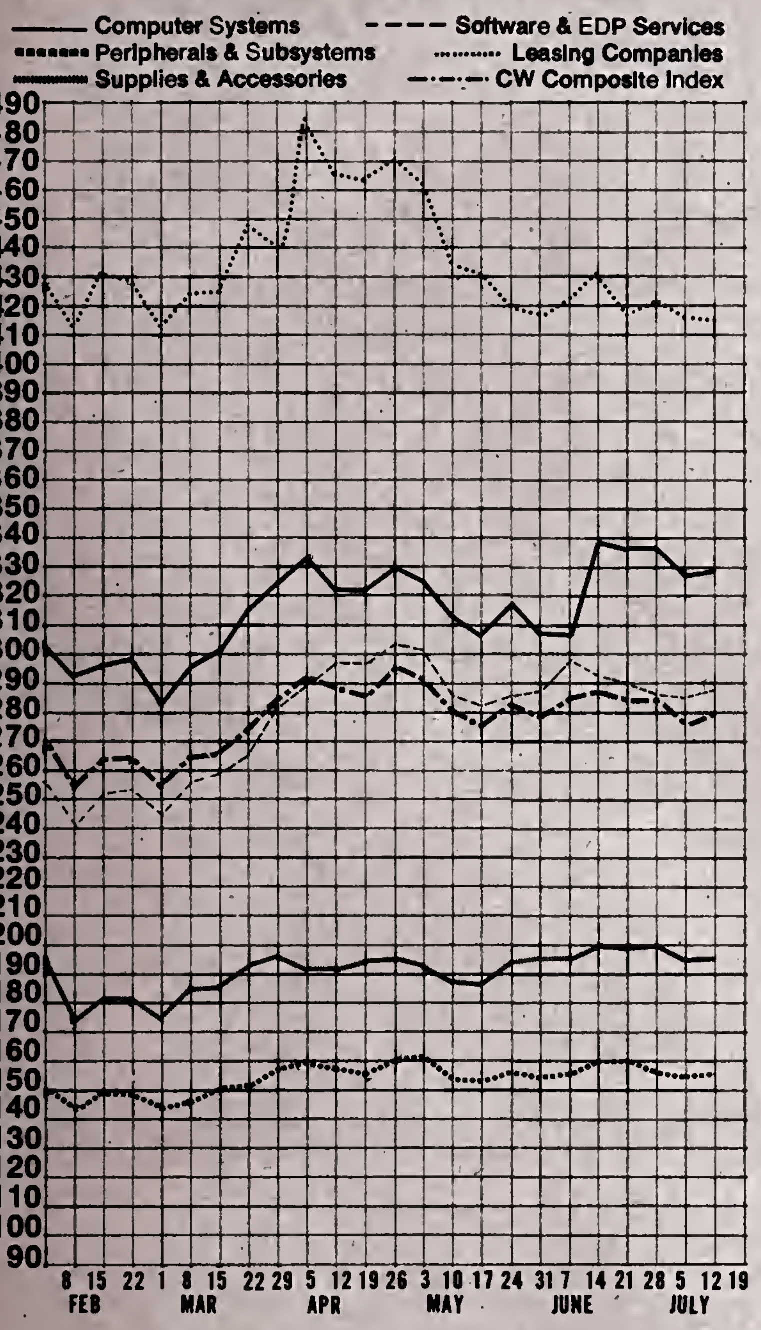

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Earnings	(838,000)	544,000
6 Mo Shr	....	.27
Ravenua	34,070,000	17,518,000
Earnings	(86,000)	727,000

COMPUTER MICROGRAPHICS
Three Months Endad May 31

	1979	1978
Shr Ernd	$.18	$.12
Ravenua	4,303,356	3,143,455
Earnings	188,509	145,178
9 Mo Shr	.48	.35
Ravenua	12,179,134	8,817,008
Earnings	579,810	417,723

TELECREDIT
Yaar Endad April 30

	1979	1978
Shr Ernd	$.91	$.51
Ravanue	31,830,000	24,698,000
Earnings	1,470,000	817,000
3 Mo Shr	.19	.19
Revenua	8,522,000	8,970,000
Earnings	310,000	301,000

ADVANCED MICRO DEVICES
Three Months Endad June 24

	1979	1978
Shr Ernd	$.92	a$.47
Ravenue	50,529,000	30,361,000
Earnings	4,698,000	2,271,000

a-Adjustad for a 50% stock dividand in September 1978.

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Yaar Endad March 31

	1979	a1978
Shr Ernd	$.24	$.11
bRevenua	17,864,000	14,356,000
Earnings	127,000	62,000

a-Rastated to reflect discontinuad oparations.
b-From continuing oparations.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 11, 1979

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCM		PRICE 1978-79 RANGE (1)	CLOSE JUL 11 1979	WEEK NET CMNGE	WEEK PCT CMNGE
A	AMDAHL CORP	23- 69	26 3/8	+ 3/4	+2.9
N	BURROUGHS CORP	59- 87	69 1/8	- 1/8	-0.1
O	COMPUTER AUTOMATION	11- 44	11	0	0.0
N	CONTROL DATA CORP	23- 44	41 3/4	+2 3/4	+7.0
O	CRAY RESEARCH INC	8- 39	34 1/2	- 1/2	-1.4
N	DATA GENERAL CORP	42- 74	66 3/4	+ 1/8	+0.1
N	DATAPOINT CORP	34- 82	74 1/4	+1 1/4	+1.7
N	DIGITAL EQUIPMENT	39- 58	54 3/8	- 1/4	-0.4
N	ELECTRONIC ASSOC.	2- 13	6 3/8	+ 1/8	+2.0
A	ELECTRONIC ENGINEER.	9- 19	10 5/8	+ 1/8	+1.1
N	FOUR-PHASE SYSTEMS	19- 46	33 1/8	+ 1/8	+0.3
N	FOXBORO	28- 44	41	+3	+7.8
O	GENERAL AUTOMATION	7- 26	12 3/8	- 1/8	-1.0
O	GRI COMPUTER CORP	1- 3	1 3/8	+ 1/8	+10.0
N	HEWLETT-PACKARD CO	62- 98	95 1/4	- 3/4	-0.7
N	HONEYWELL INC	43- 76	69 3/4	+1 3/8	+2.0
N	IBM	72-321	71 5/8	- 3/4	-1.0
O	MANAGEMENT ASSIST	9- 29	17 1/2	+ 7/8	+5.2
O	MANUFACTURING DATA S	9- 26	26	+ 1/2	+1.9
O	MICRODATA CORP	10- 31	26 5/8	-3 3/8	-11.2
O	MINI-COMPUTER SYST	4- 8	4	- 3/4	-15.7
O	MODULAR COMPUTER SYS	7- 18	12 1/8	0	0.0
N	NCR	37- 72	68 3/8	+2 5/8	+3.9
N	PRIME COMPUTER INC	9- 22	16 1/4	+ 3/4	+4.8
N	PERKIN-ELMER	17- 34	27 3/4	-1 1/8	-3.8
N	SPERRY RAND	33- 51	45 5/8	+ 1/2	+1.1
A	SYSTEMS ENG. LABS	11- 24	12 1/2	+ 3/8	+3.0
O	TANDEM COMPUTERS INC	13- 37	27 1/4	-2 1/4	-7.6
A	WANG LABS.	6- 22	20 3/8	+1 5/8	+8.6

LEASING COMPANIES

EXCM		PRICE 1978-79 RANGE (1)	CLOSE JUL 11 1979	WEEK NET CMNGE	WEEK PCT CMNGE
O	BOOTHE COURIER CORP	13- 21	18	- 1/2	-2.7
O	COMDISCO INC	3- 21	16	+1 1/2	+10.3
A	COMMERCE GROUP CORP	1- 1	1/2	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	3 1/2	- 1/8	-3.4
O	CONTINENTAL INFO SYS	5- 15	5	0	0.0
M	DATRONIC RENTAL	1- 4	3	- 1/4	-7.6
A	DCL INC	3- 5	5 1/4	0	0.0
N	DPF INC	8- 14	11	- 1/8	-1.1
N	ITEL	10- 36	11 1/4	+ 1/4	+2.2
N	LEASCO CORP	24- 43	41 1/4	+ 1/2	+1.2
O	LEASPAC CORP	1- 4	1/2	0	0.0
A	PIONEER TEX CORP	3- 7	3 1/4	0	0.0
N	U.S. LEASING	13- 20	16	- 1/8	-0.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCM		PRICE 1978-79 RANGE (1)	CLOSE JUL 11 1979	WEEK NET CMNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 1/2	0	0.0
O	ANACOMP INC	8- 22	15 7/8	+ 5/8	+4.0
A	APPLIED DATA RES.	8- 17	9 1/4	- 1/8	-1.3
N	AUTOMATIC DATA PROC	24- 36	32 3/4	+ 1/4	+0.7
O	COMPU-SERV NETWORK	5- 16	14 1/2	+ 1/2	+3.5
O	COMPUTER HORIZONS	1- 9	4 1/4	0	0.0
O	COMPUTER NETWORK	5- 16	8 1/4	+ 1/2	+6.4
N	COMPUTER SCIENCES	8- 17	13 3/8	+1 3/4	+15.0
O	COMPUTER TASK GROUP	1- 7	7 1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 3/8	+ 1/8	+5.5
O	COMPUT AUTO REP SVC	4- 10	7 3/8	0	0.0
O	COMSHARE	6- 26	13 1/2	-6 3/4	-33.3
O	CULLINANE CORP	14- 33	20	0	0.0
O	DATA DIMENSIONS INC	3- 9	2 1/2	0	0.0
O	DATATAB	1- 4	2 3/4	0	0.0
N	ELECTRONIC DATA SYS.	15- 25	23	-1	-4.1
O	INSYTE CORP	1- 3	1 1/4	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 3/8	- 3/8	-7.8
O	KEYDATA CORP	1- 4	3 3/8	+ 3/8	+12.5
A	LOGICON	10- 19	14 5/8	+1	+7.3
A	NATIONAL CSS INC	15- 48	47 3/4	0	0.0
O	NATIONAL DATA CORP	7- 13	12 1/8	+ 5/8	+5.4
A	ON LINE SYSTEMS INC	12- 30	21 1/2	+ 1/4	+1.1
N	PLANNING RESEARCH	4- 10	5 5/8	- 1/4	-4.2
O	PROGRAMMING & SYS	1- 1	1 1/4	0	0.0
O	RAPIDATA INC	3- 7	4 7/8	0	0.0
O	REYNOLDS & REYNOLD	18- 36	27	-1 1/4	-4.4
O	SCIENTIFIC COMPUTERS	3- 9	7 1/4	+ 3/4	+11.5
N	TYMSHARE INC	18- 41	34 3/8	+ 3/8	+1.1
A	URS SYSTEMS	5- 8	6 1/8	+ 3/8	+6.5
N	WYLY CORP	1- 7	5 7/8	+ 1/4	+4.4

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1978-79 RANGE (1)	CLOSE JUL 11 1979	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	13- 32	15 1/2	+1 3/8	+9.7
N	AMPEX CORP	10- 19	15 7/8	+1	+6.7
O	ANDERSON JACOBSON	5- 10	8 3/4	+ 7/8	+11.1
N	APPLIED DIG DATA SYS	8- 22	8 3/8	- 1/8	-1.4
O	BEEHIVE INT'L	3- 7	4 1/2	- 1/4	-5.2
A	BOLT,BERANEK & NEW	6- 14	13 1/4	+ 1/4	+1.9
N	BUNKER-RAMO	10- 24	23 1/8	- 1/8	-0.5
A	CALCOMP	3- 13	11 3/8	+ 1/8	+1.1
O	CAMBRIDGE MEMORIES	2- 9	2 1/4	+ 1/8	+5.8
N	CENTRONICS DATA COMP	16- 48	46 1/2	+ 1/8	+0.2
O	COGNITRONICS	1- 4	2 3/8	+ 1/8	+5.5
O	COMPUTER COMMUN.	6- 10	8 1/4	+ 1/8	+1.5
O	COMPUTER CONSOLES	4- 16	12 1/2	- 1/4	-1.9
A	COMPUTER EQUIPMENT	3- 6	4 5/8	- 1/8	-2.6
O	COMPUTER TRANSCEIVER	1- 4	2 1/2	- 1/8	-4.7
O	COMPUTERVISION CORP	5- 31	28 3/8	+1 1/4	+4.6
N	CONRAC CORP	13- 26	16	+1 1/4	+8.4
A	DATA ACCESS SYSTEMS	0- 10	9	0	0.0
A	DATA PRODUCTS CORP	13- 25	14 7/8	- 1/8	-0.8
O	DATUM INC	2- 6	3	- 1/8	-4.0
O	DECISION DATA COMPUT	2- 6	3 3/8	+ 1/8	+3.8
O	DELTA DATA SYSTEMS	1- 1	3/4	+ 1/8	+20.0
A	DOCUMATION INC	6- 34	21	-1 1/4	-5.6
O	DATARAM CORP	6- 32	19 1/2	+1 1/2	+8.3
N	ELECTRONIC M & M	3- 9	4	0	0.0
O	FABRI-TEK	1- 2	5/8	-	-8.2
O	GENERAL COMPUTER SYS	1- 3	2 1/4	+ 1/8	+5.8
O	GENERAL DATACOMM IND	9- 21	16	- 1/2	-3.0
N	HAZELTINE CORP	10- 17	16 1/8	+1	+6.6
N	HARRIS CORP	17- 36	27 3/8	- 1/8	-0.4
O	INFOREX INC	5- 11	5 1/2	0	0.0
O	INFORMATION INTL INC	7- 12	9	0	0.0
O	INFOTON	1- 3	3 1/4	+ 3/8	+13.0
O	INTEL CORP	26- 53	50	-1 1/4	-2.4
O	INTERSIL	7- 18	15 1/4	- 3/8	-2.3
A	LUNDY ELECTRONICS	4- 8	6 3/4	0	0.0
O	MSI DATA CORP	7- 19	7	- 3/8	-5.0
N	MEMOREX	27- 59	29 3/4	- 3/4	-2.4
N	MOHAWK DATA SCI	6- 15	11 3/8	+ 3/4	+7.0
O	OMEX	2- 8	6 1/2	0	0.0
O	PARADYNE CORP	9- 18	15 1/4	-2 1/8	-12.2
O	PENRIL CORP	5- 12	11 5/8	+ 3/4	+6.8
N	PERTEC CORP	8- 17	8 7/8	+ 1/8	+1.4
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	6 1/2	- 1/4	-3.7
O	SCAN DATA	1- 5	1 7/8	0	0.0
N	STORAGE TECHNOLOGY	16- 46	16 1/2	-1	-5.7
O	T BAR INC	11- 22	16 3/4	0	0.0
O	TALLY CORP.	4- 14	12 3/4	0	0.0
A	TEC INC	6- 13	6 1/8	- 1/4	-3.9
N	TEKTRONIX INC	33- 57	54 1/8	+1 5/8	+3.0
N	TELEX	3- 9	4 5/8	- 3/8	-7.5
O	TESDATA SYSTEMS CP	9- 26	14 1/4	+ 1/2	+3.6
O	WILTEK INC	1- 2	5/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978-79 RANGE (1)	CLOSE JUL 11 1979	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	9 5/8	+ 1/2	+5.4
O	BALTIMORE BUS FORMS	1- 4	3/4	0	0.0
N	BARRY WRIGHT	14- 34	15 3/4	0	0.0
O	CYBERMATICS INC	1- 1	7/8	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	22 3/8	0	0.0
N	ENNIS BUS. FORMS	5- 15	14 1/2	- 1/2	-3.3
N	3M COMPANY	43- 66	55 1/8	-1 1/8	-2.0
O	MOORE CORP LTD	26- 34	31	- 3/4	-2.3
N	NASHUA CORP	18- 37	22 7/8	+1 5/8	+7.6
O	STANDARD REGISTER	20- 29	27 3/4	+ 3/4	+2.7
A	TAB PRODUCTS CO	8- 16	14 1/4	- 1/4	-1.7
A	WABASH MAGNETICS	10- 22	16	+ 1/4	+1.5
N	WALLACE BUS FORMS	18- 33	25 7/8	+ 5/8	+2.4

Joan Cosbey
Manager—personnel services.

William E. Coday
VP, director—employee relations.

Richard G. Patterson
Manager—corporate systems.

Ralston Purina's continuing program for human resource management.

Top level support and InSci.

Bill Coday is VP and director of employee relations at Ralston Purina. He's probably done more than anyone at Checkerboard Square to professionalize the personnel function. Two of his moves: continuing senior management support and a continuing relationship with InSci.

"Personnel has come of age," he says. "In any area—employee records, benefits, EEO, compensation and so on—you have to know the discipline. You have to be a professional, set direction, provide support from the top down. Above all you need information. That's where InSci comes in. In a company such as ours, we need the flexibility of InSci systems. And the expertise of InSci people that goes far beyond the systems."

Adds personnel services manager Joan Cosbey, "Our data was spread out, limited, not available in standardized form. Moreover, the company had doubled in size. Government regulations were strangling us. We had to have a better system."

Ralston Purina has that system now—with firm plans to add more InSci capabilities. Claims corporate systems manager Dick Patterson, "It's the easiest system I've ever installed. It has actually reduced our DP investment in the personnel function."

Continuing professional support is the kind of value you can expect from InSci. We have designed and installed personnel/payroll systems for more than 550 corporations. InSci has the only personnel system to receive the 50 million dollar sales achievement award. And human resources is our only business.

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